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Arnold, J. O., Philadelphia, Pa.
Ayres, Daniel R., New York, N. Y.
Bandler, S. Wyllis, New York, N. Y.
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White, Chas. S., Washington, D. C.
Worrall, Ralph, Sydney, N. S. W.
Ziegler, Charles Edward, Pittsburgh, Pa.
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VI

THE AMERICAN
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VOL. LXXVI. JULY, 1917. NO. 1

ORIGINAL COMMUNICATIONS.

THE CESAREAN SCAR, AN ANATOMICAL STUDY.

BY

J. R. LOSEE, M. D.,

Pathologist to the New York Lying-In Hospital.

New York City.

(With ten illustrations.)

After the initial Cesarean section, labor in a subsequent pregnancy at term is always associated with more or less anxiety. If we were certain about the complete union of the uterine wound following the primary section there would be no occasion for such anxiety, because uterine muscle will regenerate completely, if there has been no infection, if there has been perfect coaptation of the incised tissue and if the cut surfaces once approximated are not separated by blood clot or lochia. These are the conditions which cause a weakened scar with occasional rupture, and on which the dictum of "once a Cesarean always a Cesarean," was founded.

Green(1), Harrar(2), Marioton(3), and Williams(4) have reported cases of successful delivery by the natural passage after a Cesarean operation. The second case of Williams' is especially noteworthy and shows the tension which can be endured by a properly healed wound, for this patient after being in labor fourteen hours was finally delivered by forceps following manual dilatation.

McPherson(5) in a paper on multiple Cesarean section in referring to the clinical appearance of the scar at the second or third operation, found one rupture, five thin, and thirty-three normal or invisible scars.

Walls(6) has reported a case which showed signs of an accidental hemorrhage ten days before the termination of a second pregnancy. An immediate laparotomy presented a uterine scar which on histological examination did not show an increase in fibrous tissue nor any degeneration of the muscle structure.

Findley(7), more recently in a complete review of the literature on rupture of the Cesarean scar, finally concluded by saying that "we are not justified in voicing the slogan, 'once a Cesarean always a Cesarean,' nor can we rely explicitly upon the integrity of the uterine scar in every case." Furthermore, we would conclude that the liability of rupture is a real danger and should stand as an argument against the increasing tendency to widen the scope of elective Cesarean operation.

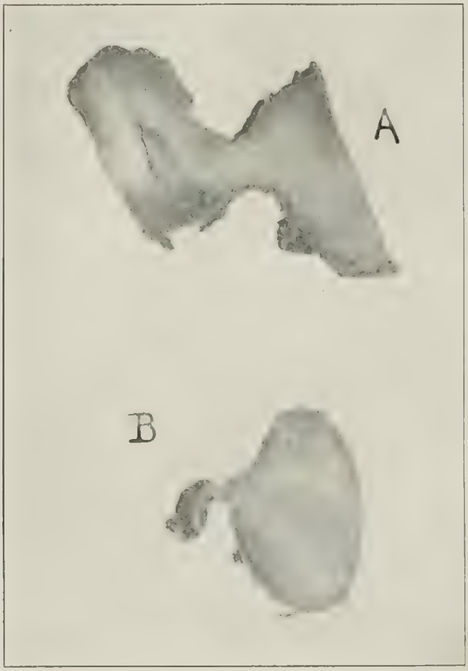

Fig. 1.—(*a*) A cross-section of case No. 1 showing a typical partially united scar with depressed serous and concave inner surfaces. The myometrium in this specimen is 7 mm. in thickness. (*b*) is a cross-section of case No. 8, a scar which was cut through by the operator and is composed of thickened peritoneum only. The specimen shows that peritoneum alone held the myometrium of both sides together.

Mason and Williams(8) made a series of experiments on pregnant guinea-pigs and cats to determine the relative strength of the scar. Weights were suspended from sections of the uterine wall containing linear scars and it was found that the rupture was invariably in the muscle and not in the scar. This experimental observation would doubtless prove true if applied to the scar in the adult human uterus which has healed under ideal conditions and likewise an infected experimental scar would rupture or be thinned out as readily as the infected scar in the adult.

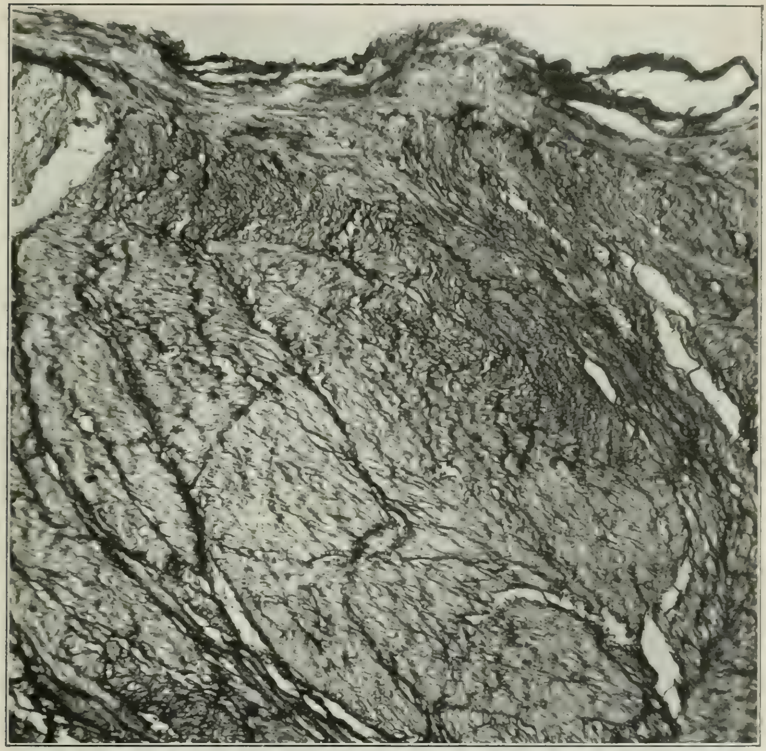

FIG. 2.—A section through the wall at the fundus of a normal postpartum uterus, completely contracted. It shows the thickness of the serosa and the relative proportion of muscle and fibrous tissue present. This relation varies in different specimens.

Couvelaire (quoted from Audubert), examined the uterine wound of two cases dying five days after operation, and said that the edges were united by a band of fibrin and this forms a basis for the union between the cut muscle bundles. He also says that there is no regeneration between smooth muscle fibers and that a fibrous cicatrix is inevitable.

Audubert(9) disagrees with him, and has reported a case which shows complete regeneration of muscle.

The following observations were made from twenty different specimens of uterine scar removed from the uterus at or near term. All the previous Cesareans were the transperitoneal operation of the high incision type. In nine there was a complete or partial rupture of the uterus, and in eleven an incision was made either through the old scar or adjacent to it, and the whole scar or the edges were afterward excised for examination. Many specimens were taken while the uterus was partially contracted, and others after rupture with complete contraction. Sections for microscopical

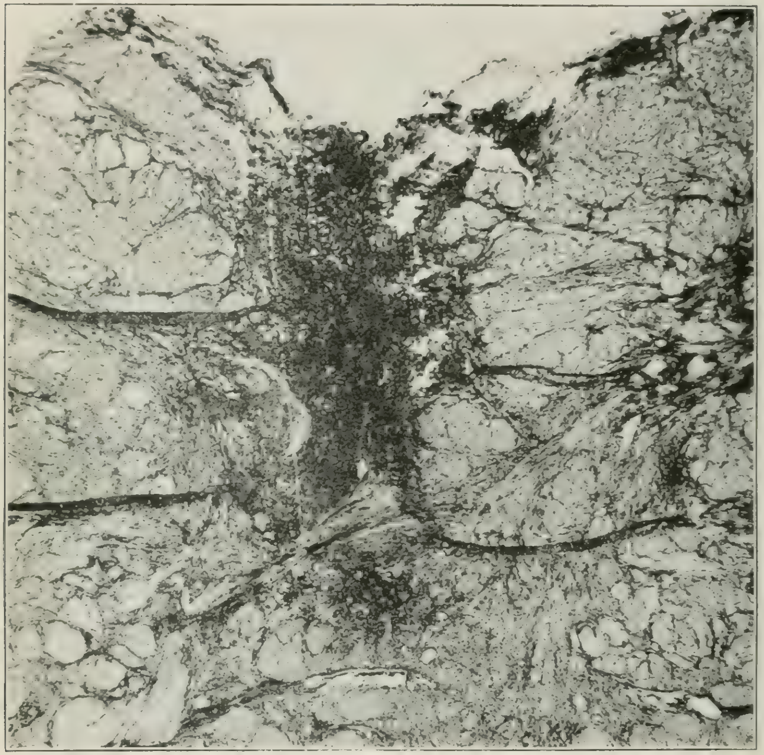

FIG. 3.—Section of case No. 6 directly through the old scar shows a thickened peritoneum which penetrates the muscle for some distance. The muscle tissue in line with the former incision is absolutely normal as far as can be determined by histological examination.

examination made from different areas of the tissue were stained with hematoxylin eosin and Van Giesen's solution. Tissue from ruptured uteri was also stained with Sudan iii.

In a clean wound after incision, leukocytes, red blood cells, fibrin, and later young connective-tissue cells, separate the surfaces. These are afterward absorbed and eventually the muscle and fibrous tissue strands, separating the muscle bundles, assume the relationship normally observed in other areas of a postpartum uterus. Other than thickened peritoneum there is no scar tissue observed macroscopically or microscopically in the myometrium, in the line of the former incision when examined at subsequent Cesarean operations.

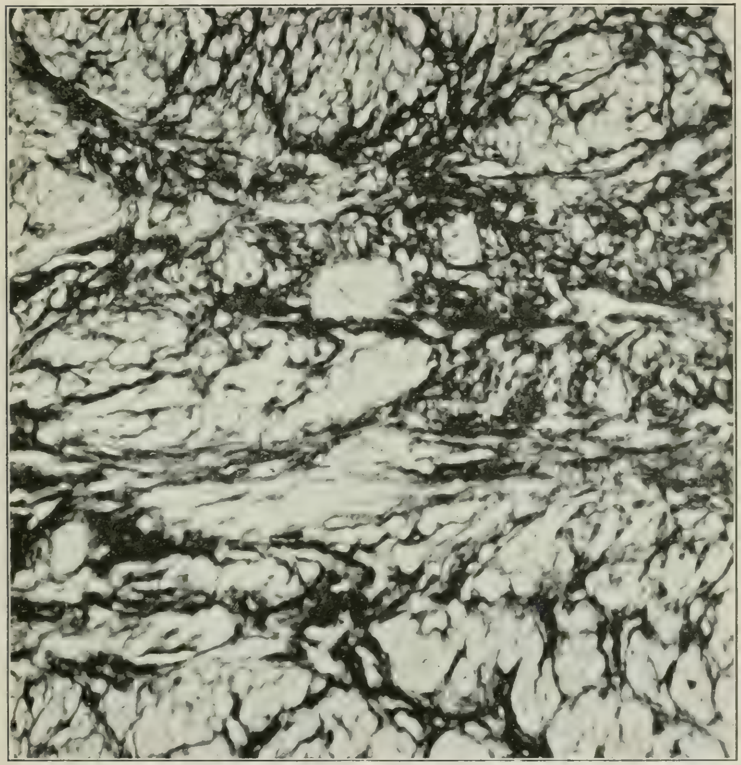

Fig. 4.—Microphotograph of a higher magnification of Fig. 3; shows the relative proportion of muscle and fibrous tissue present.

When infection takes place and the cut surfaces are infiltrated with leukocytes and serum, associated with more or less necrosis, then only that muscle tissue remains which has not become necrotic. Such a scar at operation is from ½ to 2 cm. broad, white and depressed. The tissue comprising it may be only serosa and decidua or these may be separated by varying thicknesses of muscle depending on the extent of destruction or the degree of union which has taken place after the operation. This pathological process may take place in one small area of the wound or may extend throughout. Even in these cases no excess of fibrous tissue is observed in the line of incision, however, in two of the scars examined a small amount of muscle adjacent to the decidua was replaced by fibrous tissue. Nearly all of the sections examined showed a thickened vascular serosa which occasionally invaded the adjacent myometrium for a short distance. This invasion may have been due to some inversion of the serosa in suturing and in others to a proliferation of the fibrous tissue of the peritoneum. In only one of the twenty cases did the fibrous tissue extend into the muscle to a marked degree, and even then it was not sufficient to weaken the scar.

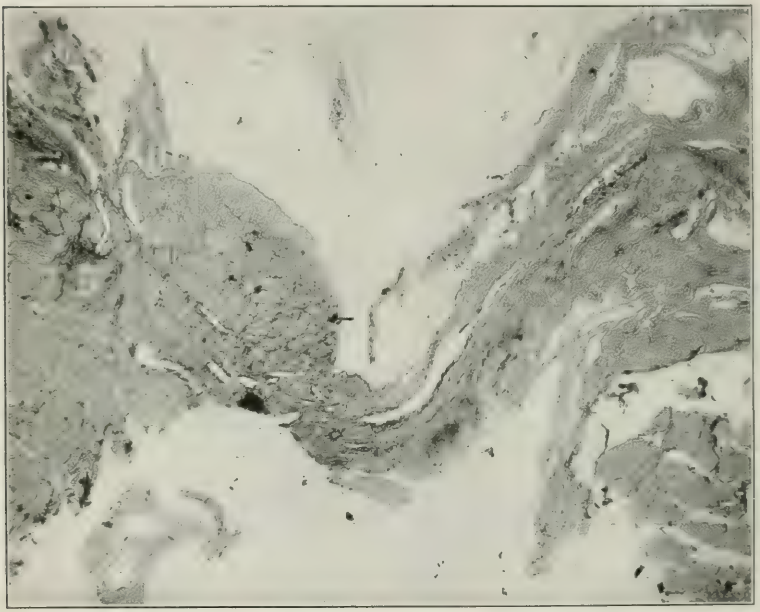

FIG. 5.—Section from case No. 4 showing a very thin scar made up of muscle and decidua only.

Again if the cut surfaces are separated aseptically, due to some mechanical influence, the same picture is presented. In the nonpregnant uterus these surfaces approximate one another but they are not firmly united, and when the uterus enlarges during pregnancy they separate, leaving only the muscle tissue that did unite at the upper angle of the wound. This gives the wound a triangluar appearance on cross-section as observed in Fig. 1 and very often the sides of the triangle are covered with decidua and if the placenta is situated beneath the wound, villi are also observed.

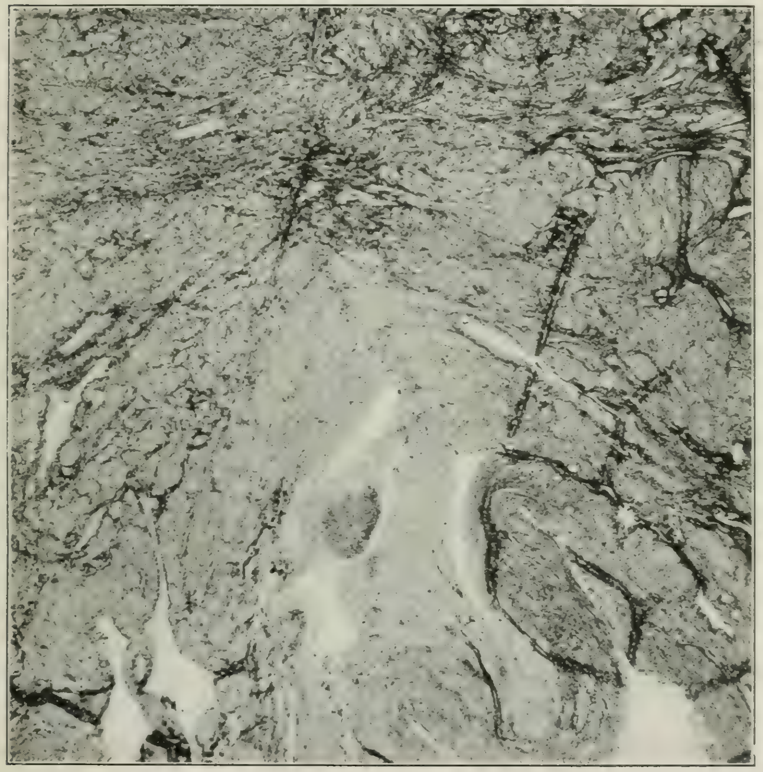

FIG. 6.—Another section of case No. 4 which is somewhat thicker and composed of thickened peritoneum, muscle and decidua.

With reference to the appearance of the nonpregnant uterus some years after section, Webster(10) in discussing a paper on ruptured scar before the Chicago Gynecological Society said that he had excised a uterus years after Cesarean had been performed and found that all that remained of the former scar was a small white line ½ inch in length. He says that the wall of the uterus was absolutely normal and as thick in front as behind. No microscopical examination of the scar was made, however.

Fig. 10 is a photograph of a nonpregnant uterus excised for carcinoma of the cervix one year after Cesarean section was performed. The specimen presents a depressed scar about 2 inches in length on the anterior surface of the uterus. The operation was of the low incision type and the convalescence was normal.

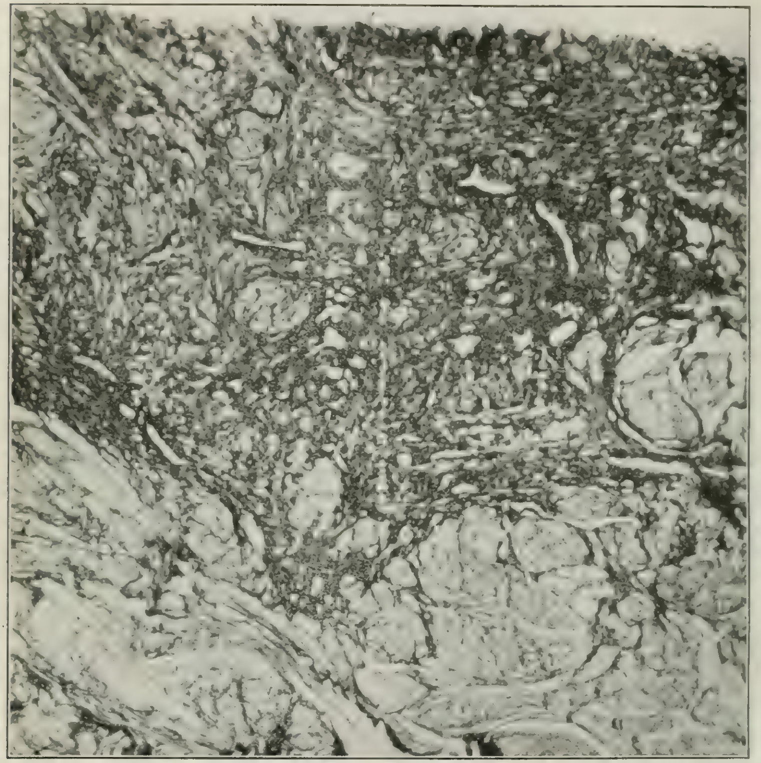

Fig. 7.—Section from case No. 19 and shows excessive fibrous tissue in the subperitoneal structures. It is limited, however, for a normal amount of muscle is also observed in this field.

Of the nine cases of rupture at operation two presented a utero-abdominal fistula, in seven the whole scar was laid open, and in three of these the placenta and fetus were in the peritoneal cavity. A review of the clinical data of these cases shows that only four had fever complicating the operation immediately prior to the rupture, and the time between the last section and the examination varied from one to five years. In four of the seven cases of complete rupture microscopical examination showed that villi were present either in the angle of the old wound or along its edges. Decidua was also observed lining the edges of some of the old scars. In two cases a slight excess of fibrous tissue was observed and this was found on the inner surface between the decidua and the normal muscle. It was in no way connected with the former line of incision. There was no fat present in the muscle cells of any of the sections. In as much as fever was present as a complication in only four of the cases, one would conclude that foreign material, either blood or lochia, prevented a firm union of the scar in the other five. The very fact that decidua covered the edges is sufficient to prove that these margins were separated when the patient became pregnant.

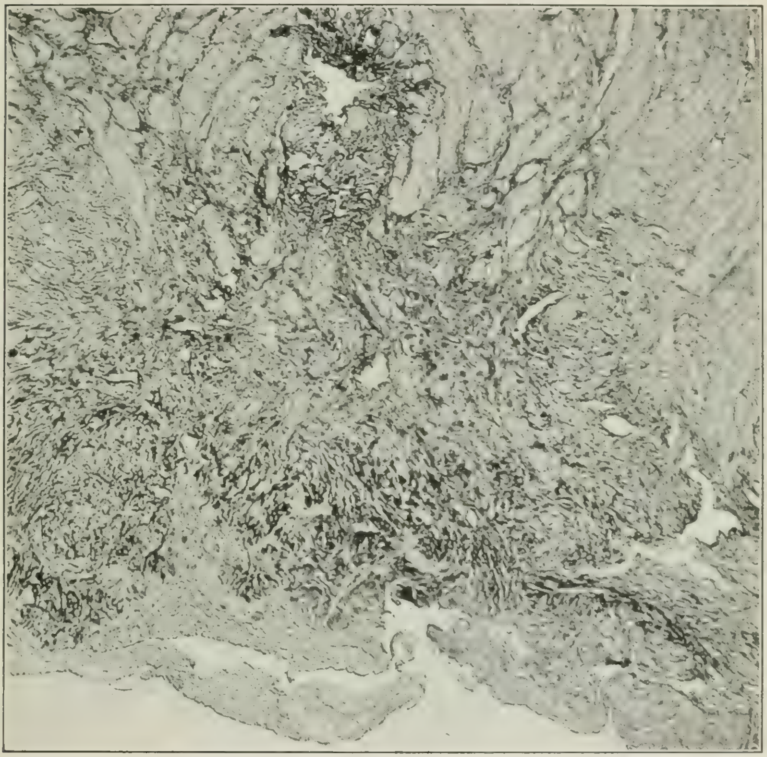

FIG. 8.—Section from case No. 14, shows the margin of the poorly united incision with fibrous tissue adjacent to the decidua. It has replaced some of the myometrium.

Five moderately strong scars were found on examination of the whole scar or margin only. In two of these there was no fever after the previous section; in two the previous history was not obtained, and in one the patient had some temperature. Microscopical examination of one of these scars showed a small area in which the muscle was replaced by a delicate fibrous tissue network, and in another there was more extensive proliferation of fibrous tissue beneath the peritoneum (Fig. 7) than is usually observed. In four the placenta was attached directly beneath the wound, which shows that the location of the placenta had little effect on the scar providing there was firm union after the previous operation. There were six cases in this series which presented thin scars varying from peritoneum only between the edges of the myometrium, to different

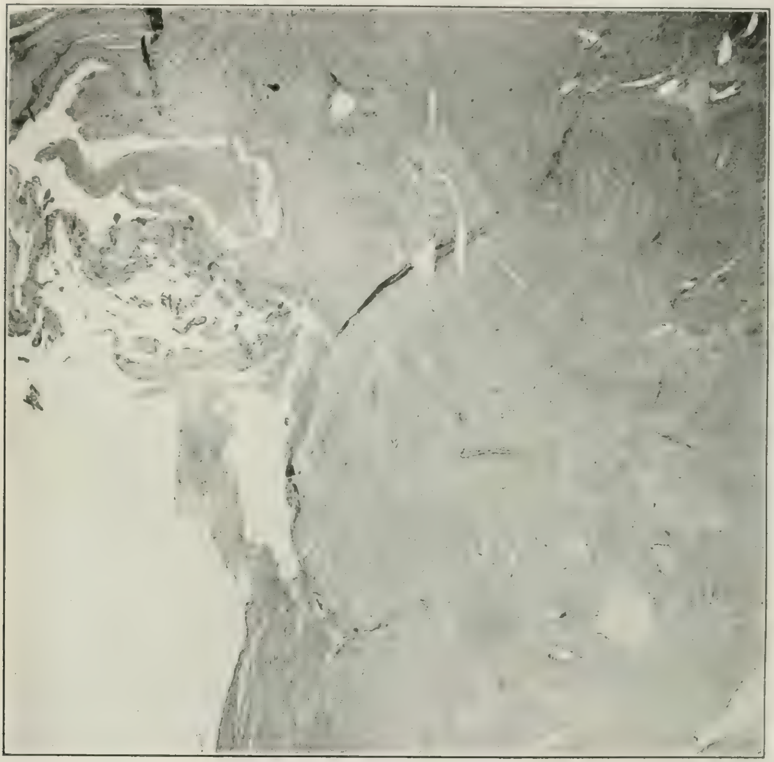

FIG. 9.—Section from case No. 13, from the margin of the rupture of the former scar. The upper angle shows that the scar was almost entirely composed of peritoneum, beneath which are numerous placental villi. Decidua are also observed along the former incised surface.

amounts of muscle tissue. Three of these had fever following the preceding operation, and an excess of fibrous tissue was not observed in any of them.

Examinations were made of the line of incision of the former operation in six different cases, two of which were thick and four were thinned out. The interval between the last section and the operation was from one to three years. One of the four was a moderately thick scar throughout, but it presented one small area in which the myometrium had been replaced by short connective-tissue fibers. Another varied in thickness from 2 mm. to 1.2 cm. and the thicker area consisted of myometrium which was identical in every detail with the myometrium in adjacent areas. All presented thickened peritoneum with some subperitoneal proliferation of fibrous tissue.

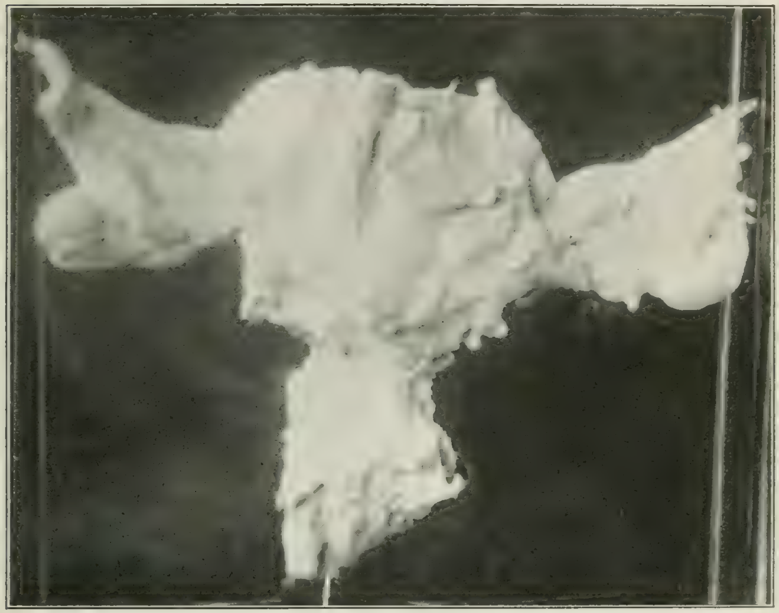

FIG. 10.—Shows the Cesarean scar in a uterus one year after operation.

CONCLUSIONS.

1. The strength of the uterine scar after Cesarean section depends upon the absence from the wound of infection and foreign material and upon the perfect coaptation of the incised surfaces.

2. A perfectly healed wound leaves the myometrium as strong after operation as before, as far as can be determined by the histo-

J. R. LOSEE. STUDIES OF CESAREAN SCARS.

Case No.	Ruptured	Examination of cross-section of whole scar	Uterus fully contracted	No. Cesareans before examination	Years between last Cesarean and examination	Month ruptured	Placental site	Complications following previous Cesareans	Gross appearance as noted by operator	Gross appearance (laboratory)	Microscopical examination		
											Peritoneum	Increase of fibrous tissue	Syncytial and inflammatory cells
1.	No.	Yes.	No.	One.	One.	.....	Post. wall.	Fever and broken down wound.	Two. cm. broad. Thin.	Typical shape 3 mm. in thickness at thinnest area.	Thickened.	None.	None.
2.	Yes.	Yes.	No.	One.	One.	Full term.	Ant. wall.	Fever.	Uteroabdominal fistula open 1.5 cm. at lower angle.	Typical shape 4 mm. in thickness at thinnest area.	Thickened.	None.	Many present.
3.	No.	Yes.	No.	One.	Not observed.	....	Ant. wall.	Not observed.	Not easily observed. Strong.	Thick, not typical.	Thickened.	Very small amount in one area.	None.
4.	No.	Yes.	No.	Three.	Three.	....	Post. wall.	None.	Upper part thick. Lower part thin.	From 1 mm. to 1 cm. in thickness. Typical shape.	Thickened.	None.	None.
5.	No.	Yes.	No.	One.	One.	....	Ant. wall.	None.	Not easily seen. Strong.	Not typical. Thick.	Thickened.	None.	None.
6.	No.	Yes.	No.	Two.	Three.	....	Ant. wall.	Fever after second section.	Broad and thin.	2 mm. to 1.2 cm. in thickness. Typical.	Thickened and invades muscle somewhat.	None.	None.
7.	Yes.	Margin of scar.	No.	One.	Two.	Full term.	Ant. wall.	Fever.	Ruptured throughout.	Peritoneum only at edges held myometrium together before rupture.	Thickened.	None.	None.
8.	Yes.	Margin of scar.	No.	One.	One.	Seven mos.	Ant. wall.	Fever.	Ruptured throughout.	Peritoneum only held myometrium together.	Thickened. Villi immediately beneath it.	None.	None.
9.	Yes.	Margin of scar.	No.	One.	Two.	Full term.	Ant. wall.	None.	Wound open whole length.	Not observed.	Not observed.	Slight increase in the myometrium adjacent to th decidua.	None.
10.	Yes.	Margin of scar.	Yes.	One.	Three.	Full term.	Fetus and placenta in p. cavity.	None.	Ruptured throughout.	Typical.	Thickened. Villi in angle of wound.	None.	Many present.

J. R. LOSEE. STUDIES OF CESAREAN SCARS.—*Continued.*

Case No.	Ruptured	Examination of cross-section of whole scar	Uterus fully contracted	No. Cesareans before examination	Years between last Cesarean and examination	Month ruptured	Placental site	Complications following previous Cesareans	Gross appearance as noted by operator	Gross appearance (laboratory)	Microscopical examination		
											Peritoneum	Increase of fibrous tissue	Syncytial and inflammatory cells
11.	Yes.	Margin of scar.	Yes.	Two.	Five.	Full term.	Fetus and placenta in p. cavity.	Fever after second section.	Ruptured through-out.	Uterus. Laceration through whole scar.	Thickened. Villi observed at edge of wound.	None.	None.
12.	Yes.	Margin of scar.	No.	Two.	One.	Full term.	Ant. wall.	None after operation No. 2.	Upper part of scar thin 1.5 cm. wide, lower part open.	Typical.	Thickened edges covered with decidua.	None.	None.
13.	Yes.	Margin of scar.	Yes.	Three.	Three.	Full term.	Fetus and placenta in p. cavity.	Fever after operation No. 2. None after No. 3.	Ruptured through-out.	Laceration through the old scar.	Thickened edges lined with decidua, and Villi adjacent to peritoneum.	None.	Many present.
14.	Yes.	Margin of scar.	Yes.	One.	One.	Ninth month.	Post. wall.	None.	Ruptured through-out.	Typical. Peritoneum holds edges together. 2 mm. thick.	Thickened.	Adjacent to decidua, small amount of replaced muscle.	None.
15.	No.	Margina of scar.	No.	Two.	Six.	....	Post. wall.	Fever after operation No. 1. None after No. 2.	White irregular 1 cm. wide.	4 mm. thick.	Thickened.	None.	None.
16.	No.	Margin of scar.	No.	Two.	Not observed.	....	Ant. wall.	No fever after either operation.	Thin.	Typical.	Thickened.	None.	Many.
17.	No.	Margin of scar.	No.	Two.	Three.	....	Ant. wall.	No fever.	Thin.	Typical.	Not observed.	None.	Few.
18.	No.	Margin of scar.	No.	Two.	Three.	....	Ant. wall.	None.	Thick and strong.	Thick.	Not observed.	None.	None.
19.	No.	Margin of scar.	No.	One.	Four.	....	Ant. wall.	Fever.	Thick and strong.	1 cm. thick.	Thickened	Some subperitoneal in one area.	None.
20.	No.	Margin of scar.	No.	One.	Three.	....	Post. wall.	Not observed.	Thick and strong.	8 mm. thick. Typical scar, though not marked.	Thickened.	None.	None.

logical examination of the tissue in the line of the former incision.

3. A continuous suture in the myometrium adjacent to the decidua may assist in preventing the separation of the cut surfaces by blood clot or lochia in addition to the usual interrupted suture through serosa and myometrium.

4. The placenta in a subsequent pregnancy has little or no effect in weakening the firmly united scar, but if the scar is already weak it may accentuate this weakness.

5. Other than a small amount of fibrous tissue beneath the peritoneum, the myometrium in line with the former incision contains no scar tissue and the uterine muscle regenerates.

6. Rupture invariably takes place through the site of the former scar and not through the adjacent muscle tissue.

7. Without definite means of estimating the strength of the uterine scar after Cesarean section subsequent pregnancies must always be carefully observed as they approach term.

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20 EAST THIRTY-FIFTH STREET.

SEVERAL EVERY-DAY OBSTETRIC PROBLEMS.*

BY

JOS. B. De LEE, A. M., M. D., F. A. C. S.,

Chicago, Ill.

(With one illustration.)

Obstetric Asepsis and Antisepsis.—I make no excuses for bringing this old, worn, and trite subject to your notice. On the contrary, there is good reason for making it the order of the day in every medical society. There should be established an "Association for the Study and Prevention of Child-bed Fever," and a propaganda inaugurated similar to that against infantile paralysis. The importance of anterior poliomyelitis sinks into insignificance compared with that of puerperal infection.

In 1914, there died during childbirth, in the United States, 10,518 women; of these, 4664 died of puerperal septicemia. To these must, in my opinion, be added most of the 378 deaths from "phlegmasia alba dolens, puerperal embolism and sudden death," as given by the United Census Reports for that year, since it is fairly certain that these diseases are practically all due to infection. In round numbers then, in a registered area of 66.8 per cent., 5000 women are reported dead of puerperal infection in one year in the United States. On this basis it is safe to say that in the total area of our country 7000 puerperæ die each year of infection, without taking into consideration the large number of women who, through ignorance or direct concealment of their medical attendants, are buried under another diagnosis. Then, too, we did not reckon the postponed mortality, the result of permanent disease acquired in childbirth, or from operations performed for the relief of such disease. Only a few examples need be mentioned; heart disease from endocarditis *in puerperio;* ureteral distortion, death from surgical kidney; uremia from nephritis after puerperal infection; death from operation for pus tube or adherent misplaced uterus following a peritonitis, which death may be months or years after the primary infection.

Taking everything into consideration I feel sure that the statement cannot be contested—that 8000 women die *annually* in this country from puerperal infections.

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*Read before a meeting of the New York Obstetrical Society, March 13, 1917.

Dr. Grace L. Meigs, in a recent report issued by the Children's Bureau, Department of Labor, Washington, D. C., came to identical conclusions and states that these figures are a "gross underestimate." She shows, too, that there has been no improvement during the last thirteen years, while there has been a striking decrease of the mortality rates for typhoid fever, diphtheria and tuberculosis, the typhoid rate being cut in half, diphtheria reduced more than 50 per cent., and a substantial reduction having been effected in tuberculosis, about 25 per cent. As a cause of death among women, between the ages of fifteen and forty-four years, childbirth ranks second to tuberculosis.

These figures show the possibilities of a properly directed propaganda against typhoid, diphtheria and tuberculosis, and at the same time they cast a dubious reflection upon us obstetricians.

In England and Wales, while the general mortality in childbirth has decreased, there has not been a corresponding improvement in puerperal sepsis. In Germany, in 1915, Buess showed that in the years 1906 to 1911 inclusive, of 12,170,604 births, there were 35,809 deaths of mothers, of which 48.8 per cent. were due to infection, the largest percentage since 1893, but the general obstetric mortality, from other causes than puerperal infection has decreased from 3.9 per cent. to 2.93 per cent. per thousand births.

So much for the mortality: now the morbidity. Here we are forced into pure speculation, because of the impossibility of obtaining figures even half way reliable. Lea gives the percentage of fevers *in puerperio* as from 10 to 30, culled from the published statistics of European clinics. Cragin gives the percentage of fever above 100.6° at Sloane as 10.7 per cent. In the outservice of the Chicago Lying-In Hospital, in 1911, 1912, we had 10.8 per cent. of fevers over 100° F. So many errors, both subjective and objective, underlie this particular phase of the subject that I will abstain from giving further statistics. I believe you will not disagree with me when I say that where one woman dies of severe puerperal infection, five get well. If you admit this, then 35,000 cases of puerperal fever occur every year in the United States. Furthermore, without doubt many thousands of mild cases of puerperal infection occur. The woman has a slight rise of temperature, often lasting but a day or two, there may be only a little pelvic pain and the evidences of illness may be insignificant, but anatomic traces of the infection are bound to be left, as was emphasized by your own Thos. Addis Emmett, forty years ago.

Later on we find peritoneal bands, parametrial thickenings, occluded tubes, distorted and displaced uterus, rectum, bladder, ureters—with their inevitable sequellæ involving life and health, in short, hundreds of thousands of women date life-long invalidism from an infectious process in the puerperium.

It is for these hundreds of thousands that I wish to speak to-night. What are we doing, what should we do to reduce the number of invalids, who date their invalidism from childbirth?

In the olden time the quality of service rendered in a maternity was measured by the maternal and fetal mortality. Nowadays, maternal mortality at least, as far as sepsis is concerned, in the maternity is almost *nil*. We judge of our methods by the morbidity of our puerperæ, and a critical, searching study, of our hospital records is not as pleasing as it should be. I am convinced that a large proportion of our cases suffer from bad obstetric practice, too much interference, too rapid delivery, spontaneous as well as artificial, but I am likewise certain that in the majority of hospitals the obstetric case is not protected by all the safeguards of asepsis and antisepsis that we have gotten to learn are essential for the prevention of wound infection. This is true of many of the maternities, and it is certainly true of the vast majority of cases conducted in private homes. The principles of obstetric asepsis and antisepsis have not yet permeated the body of the medical profession—in some instances they have hardly touched the surface.

To turn again to the hospitals and my charge against them, may I ask you—in how many of even modern hospitals is the technic in the delivery room identically as perfect as in the surgical operating room? Do the accoucheurs, the assistants, and the nurses always wear head pieces, mouth cloths, sterile gowns, etc., for every labor, for the introduction of a colpeurynter, for perineorrhaphies, etc.? I will answer for our Chicago hospitals. They do not. I have noted the most painstaking refinements of asepsis for a hemorrhoid operation, and the most crass errors of technic for a forceps delivery, both under the same roof. It will save time and prevent me from wandering too far if I bring out the points I wish to make, by means of a reference to the systems of asepsis employed in the departments of the Chicago Lying-In Hospital and Dispensary.

We have, as you have in several hospitals in New York, both an indoor and an outdoor service. Similarly, we have developed two systems of aseptic technic. These I have described as the extensive or hospital method, and the intensive or dispensary method.

The Hospital or Extensive System.—In the hospital plan every natural labor, as well as every obstetric operation, including the insertion of a colpeurynter, packing the uterus or vagina, is prepared for as we do for a laparotomy. The accoucheur, the assistants, the nurses, the anesthetist, all wear gowns, head pieces, mouth cloths, etc.; tables, bed and patient are covered with sterile sheets, etc., etc. Our hospital is an "open" one and fifty to seventy-five different physicians bring their cases here for delivery. It requires not a little tact on the part of our interns and nurses to get these men to carry out this technic in all cases, and as fully as is desirable. Particularly the mouth cloth is neglected, and the mouth, emitting droplets of bacteria-laden saliva, is surely a frequent source of puerperal infection. I have had one convincing demonstration of this fact.

It is for the preservation of the patient against the forgetfulness of her obstetrician, against his ignorance of aseptic technic, and his deliberate disregard of the laws of asepsis, that such extensive protection of the operative field is necessary. The principles of asepsis are very simple. They are exemplified in the bacteriologic laboratory every day. The absolute sterility of the immediate operative surface, and of the instrument that touches it, this is all that is required, and it is this principle which is the fundamental feature of the dispensary, or intensive system of asepsis soon to be described.

In the hospital with so many different kinds of doctors, we have to cover everything within reach with sterilized material, and we unavoidably run into another danger. The aseptic operative field becomes too large. Measure the area of the delivery bed, instrument table, solution basins, operator's gown, interns' and nurses' gowns, etc., and you will be surprised at the number of square feet it will come to. This area has all been sterilized with the greatest care and was sterile when first exposed. But how long does it remain sterile? A delivery lasts from one to four hours. Dust, scurf, droplets of saliva from those in the room whose mouths are not protected, fall on the sterile sheets, solutions, catgut, etc., and when these are touched by the sterile gloved hands the dust and bacteria are carried into the puerperal wounds. The woman in her throes of pain disarranges the sterile sheets; in her delirium she touches them; when she bears down she forcibly ejects the breath, laden with saliva, over the sterile leggings, and the hands of the operator or assistant. One does not need laboratory proof of these facts. We can see the dust and even hair on the surface of the solutions in the basins, and I have seen drops of spit fly out of the mouth of the bearing-down woman, and land on a mirror held over the abdomen. The larger the area of the sterile field and the longer it is exposed, the greater the danger. Now experience has shown that severe infections rarely arise under these circumstances, but milder infections, catgut suppurations, nonunion of wounds may often be thus explained. It is my practice, therefore, not to touch and not to let the interns and nurses touch, any more than is absolutely essential, the coverings of the bed, the table and the patient, even though these coverings were sterile when put on. A systematic reduction of the sterile operative field should be undertaken.

The Intensive or Dispensary System.—Our practice in the homes of the poor is almost identical with yours here, but I think our tenements are not so overcrowded. Our labor satchel contains no sterile towels, or gloves or sheets or instruments. The gloves and instruments are boiled at the case. The cotton wipes, the cord dressing, the pads are sterile, and carried in sealed containers. The patient is prepared by shaving; the belly is scrubbed, also the inside of the thighs. Clean leggings cover the legs. A clean towel is laid over the abdomen. The intern and student roll up their shirt sleeves and wear rubber aprons. Only the gloves, the insides of the basins, the insides of the jars and the area immediately around the vulva, just a few inches, are considered sterile, and the vulva is kept so by frequent drenching with lysol and bichloride solutions. This small area may be touched, everything else is considered infected and may not be touched and we instruct the attendants, when they speak to direct the face away from the patient so that saliva is not deposited on the vulva or the sterile things.

This is the intensive method, the laboratory idea. It is very successful in home practice. Any practitioner can learn it. I have done all the obstetric operations except pubiotomy and abdominal Cesarean section in the most squalid surroundings with uniform success, employing this method. Latterly we have added three (only 3) sterile towels to the operative satchel to cover the abdomen during combined version or manual removal of the placenta.

If there is any one feature of the hospital system to be carried over to the dispensary, I would suggest the mouth cover. Since the intern lectures to the student and nurse on the case, this added safeguard is desirable. And to the hospital plan I would recommend some points of the intensive system.

Some operators consider the modern hospital operating-room technic a closed chapter, "Un fait accompli." I do not so consider it. I have been able to pick smaller and larger flaws in nearly every system of technic I have witnessed in operation, including that devised by myself. Now it is true that in the majority of cases our defence of the patient is sufficient and our end results are good. This does not prove that our technic is perfect. We know it is imperfect because there is a not small minority of cases with septic reaction after operation, and not a few deaths from infection. These are not published but they come to the knowledge of everyone. Nature makes good our faults in operating, our slips in asepsis, as a rule, but too often the woman's resisting powers, *her* defences, are not strong enough, and a minor error leads to misfortune. We are inclined, then, to look for the cause in bad catgut, bad teeth, tonsillitis, intestinal toxemia, fat necrosis, late shock, paralytic ileus, etc., etc., but I believe all these are more easily explained by the conditions mentioned above.

If we only possessed some serum, or a vaccine, or any means of prophylactically raising the patient's resisting powers, of strengthening her defences against infection, we could then operate with a minimum of refinement of aseptic detail. But at present we know of no such serum or vaccine, and therefore we have to adopt general measures to fortify the constitution, we operate with a minimum of traumatism and shock, and we must continue to study how to make perfect and flawless our aseptic and antiseptic methods. If we wish to reduce the morbidity of childbirth as well as the mortality in the homes we must develop our methods in the hospitals to the refinement of perfection, and we must teach every physician to practise in the homes a simple intensive method like the one outlined above.

At the same time we must always emphasize the fact that an improperly conducted obstetric case, no matter how antiseptically done, still may become infected. Asepsis and antisepsis are not all that is necessary for success.

Credè enunciated two principles for the prevention of puerperal infection. One was, limit, as far as possible, puerperal wounds—the other was, prevent the infection of the inevitable puerperal wounds. The latter principle has been discussed, the other deserves more attention than it is getting. Do we strive to limit the puerperal injuries? We do not. Forceps are applied with great frequency on the slimmest indication and often without any, except bed-time or office hours. Pituitrin is administered to hasten delivery, regardless of the fact that rapid expulsion of the fetus tears the cervix and vagina. Premature bearing-down efforts are insisted upon by obstetrician and nurses, regardless of the degree of dilatation of the cervix and pelvic diaphragm, indeed the obstetric chair has been disinterred in order to overcome more quickly the resistance of the soft parts. In our city one man has, in the lay press, announced his practice of bringing on labor at term by means of bags and pituitrin, forcing the delivery from morning till evening and boasting that for over a year he has not been up at night.

It seems as if an operative *furore* has struck the profession, and the old, time-tried, time-proved and time-honored, "watchful expectancy" has been relegated to the discard. All the above practices and others which could be mentioned if time permitted, increase the number and extent of the puerperal wounds, and since virulent bacteria are often present in the vagina, infection is not seldom the result. To prevent these injuries requires a deep knowledge of the mechanism of labor and its clinical course. It behooves us to provide better teaching in practical obstetrics for our medical students and practitioners, but as long as the art of obstetrics is on such a low plane as at present, I do not expect any decided improvement in our generation.

The procession of women passing through our dispensaries and private consulting rooms, repeating monotonously the statement, "Doctor, I have not been well since my baby was born," should draw our attention to the fact that things are not right in obstetric practice, to-day. I am convinced that the causes are not far to seek. We will readily find them on lines indicated above.

The Correction of Abnormal Positions and Attitudes of the Child, Preparatory to Delivery.—Text-books generally, state that occiput-posterior positions in the majority of cases terminate spontaneously and happily for mother and child. The minority of cases of occiput-posterior positions that persist and require the assistance of art is of considerable importance. If we add to these, those cases where ill-timed and poorly executed interference is made, we have one explanation of the high infantile mortality in birth, and for injuries of the maternal soft parts, with or without infection and the inevitable permanent invalidism therefrom. I feel sure that more children die as the result of improperly managed occiput posterior positions than are saved by Cesarean section performed as it is to-day on the most flimsy indication.

Two classes of cases present themselves—those where the head does not engage and those where engagement has occurred but the occiput does not rotate to the front even during a prolonged watchful expectancy. One should have great patience, however. The bag of waters is to be preserved until dilatation is complete. A thorough examination should be made to determine the cause of the posterior position and of the delay—perhaps this cause would have given an indication for Cesarean section if it had been discovered in time.

If it becomes necessary to interfere before the head is engaged, in multiparæ version is the operation of choice, in primiparæ version is not a good operation. I usually twist the child in the uterus, passing the hand well above the promontory, operating mainly on the trunk, bringing the back well to the front; then I draw the head into the pelvis with forceps, and then leave the case to nature—or to follow a subsequent indication. Very often I finally have to deliver the patient by art, but the delay has secured a great gain—the head has become molded to the pelvis in its new position, the cervix and pelvic connective tissues have been drawn up out of the way, the pelvic floor has been prepared for the delivery—by being softened and partly dilated, and thus a formidable "high forceps operation" is replaced by a relatively simple low, or at most, midplane delivery. While this two-stage operation is very distressing to the patient, involving usually two anesthetics, and is very wasteful of the surgeon's time, the advantages are very considerable.

In those cases where the head is engaged one may seek to turn the occiput to the front by combined manipulation, working on the head within and without at the same time. Formerly I recommended pushing the head up, out of the pelvis and performing the maneuver described on the floating head, but in one case, while doing this the cord prolapsed and I had great trouble in saving the child. The difficulty has usually been, not to turn the occiput to the pubis, but to hold it there until I could get the forceps securely applied to the sides of the fetal head. The assistant, operating from without, seldom succeeded in holding the head in position for the few seconds required.

It occurred to me to retain the head in position by means of a volsellum forceps, affixed to the scalp, and I was surprised how easily it was done and how successfully this simple maneuver worked. Then I found that by using gentle traction on the head and following carefully the mechanism of labor I could turn the head from a posterior quadrant to its proper position by means of a volsellum. An ordinary 8-inch artery clamp does just as well and does not leave the tiny punctures in the scalp, although I have had no trouble from these minute injuries. For this special operation I devised a light clamp which will grasp the scalp without much injury.

I take this opportunity to condemn Scanzoni's application of the forceps. It damages the vagina, the pelvic connective tissues, and supports of the bladder too much, and is not necessary since we have the simple method here proposed, which has not failed me in over fifteen trials.

The Treatment of Face and Brow Presentations.—In a general way what was said of occiput-posterior positions applies to the treatment of these deflexion attitudes. Therefore, I will not go into detail. Where it seems inadvisable to do version, manual correction of the face or brow, changing it to an occipital presentation, is the standard treatment. Occasionally, all methods, even the improved Thorn-Schatz combination, fail to effect the extreme flexion needed. As before, the difficulty is not in getting the head into the desired attitude and position, but in holding it there long enough to get the forceps blades applied in the best manner for traction.

Here again the volsellum or the scalp forceps will be of distinct service. The head may thus be firmly anchored and steadied by an assistant, while the forceps are adjusted.

In order to see if it would be possible to effect the change from a face to an occipital presentation by means of volsella alone, I tried it on a case of face presentation—a primipara aged forty-one, with eclampsia. The patient had been in labor for two days and several attempts to change the face to an occipital presentation had failed. The child was dead and before doing craniotomy I tried this maneuver. A volsellum was attached to the scalp just at the side of the large fontanel, and while slight traction was made of this, the face was pushed up by pressure on the glabella. Then another volsellum was attached to the top of the head, and while gently pulling on this and pushing on the first one, a higher portion of the head was reached; the first volsellum was then removed and attached over the occiput, and by repeating the last maneuver the occiput was brought down. The method is similar to the bringing out of the uterus in the Watkins' interposition operation, and I was surprised to note how easily it was accomplished even in the tight vagina of an aged primipara. There was no injury to the scalp except the twelve minute punctures. I have not yet done this operation on a living baby in face presentation, but will not hesitate to do so if a case presents where other manipulations fail.

Naturally such a delicate procedure must be done with art, not with strength, a statement which applies to all manipulations in obstetric surgery. The outside hand, of course, aids the internal maneuvers.

The Prevention of Fetal Mortality in the Second Stage of Labor.—There is a period during its journey into this world that is fraught with great danger to the child. It is a critical half hour. It is just before the head is born, and, I am sure, although I cannot give you figures to substantiate the statement, that thousands of babies are lost at this particular time. The lengthening of the uterus, causing dislocation of the placenta and compression of the placenta, compression of the cord, tightening of the cord around a fetal member, all occur during the second stage and the baby is lost unless the danger be recognized early and quickly removed.

It is just at this time, however, that the accoucheur is most tempted to neglect the condition of the child. He is scrubbed up, head and mouth piece arranged, the patient is covered with sterile things and he is busy with the protection of the perineum.

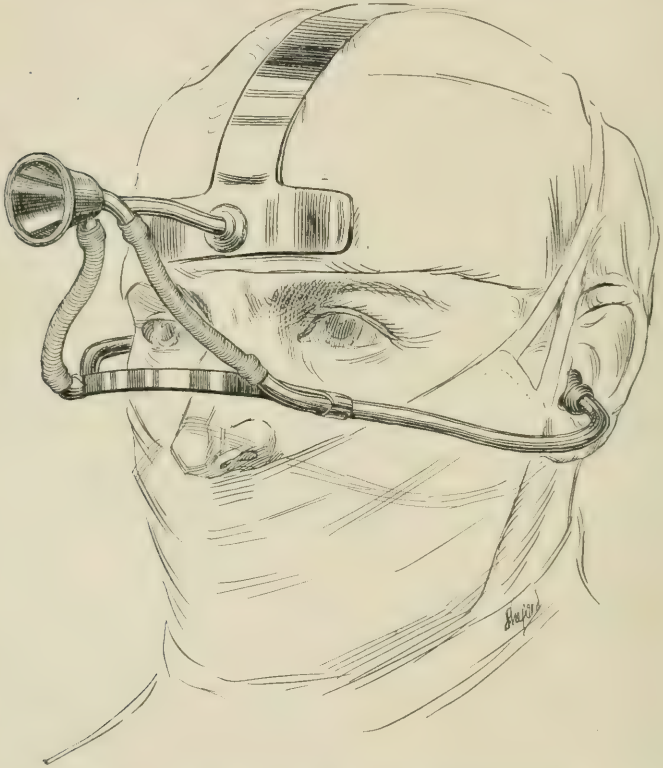

FIG. 1.—The Hillis-DeLee obstetric stethoscope.

During forceps operations, too, the child is much endangered from a variety of conditions. Unless the operator has a competent assistant, one skilled especially in hearing the fetal heart tones, many children die unobserved—and unnecessarily since the means for saving them are so close at hand.

I have often expressed the desire that someone invent an electric telegraphic apparatus which could be fastened to the abdomen of the parturient and which would register on a convenient indicator every heart beat of the fetus. My associate, Dr. David S. Hillis, suggested a stethoscope which could be worn on the head of the operator, by means of which he could hear the heart tones himself, without touching anything unsterile. Acting on Dr. Hillis' suggestion, I devised this instrument and can heartily recommend it to you. It has been in use for eight months and I like it more every day. It has the following advantages:

1. It is aseptic; the operator does not have to touch it. If needful it may be boiled.

2. It combines the advantages of air sound conduction and bone conduction in one instrument.

3. By pressing the bell in deeply one reduces the thickness of the tissues and comes close to the fetal heart. The last two factors render the tones audible even in the presence of outside noises and stertorous respiration of the mother. To one who is hard of hearing also this is a valuable help.

4. The instrument renders the auscultation of the fetal heart very simple, very quick, very easy, and therefore one will listen ten times more often than he would if, each time, some one had to adjust the ordinary stethoscope to his ears, or if the assistant had to be asked to listen. Further, the danger of the assistant or the nurse touching the sterile field is obviated, and the accoucheur gets personal, and positive information of the condition of the child all the time.

5. The use of such a special instrument emphasizes the importance of watching and safeguarding the child's life at this critical stage.

6. By the more intensive study of the fetal heart during the second stage, made possible by this instrument, we will surely add to our knowledge of the accidents of labor, and of the diseases of the child in the first days of its life.

25 EAST WASHINGTON STREET.

CESAREAN SECTION IN PLACENTA PREVIA.*

BY

GEORGE M. BOYD, M. D.,

Philadelphia, Pa.

Cesarean section in placenta previa still has its champions and its opponents. Lawson Tait's paper, in 1899, on "The Treatment of Unavoidable Hemorrhage by Removal of the Uterus"(1), was an incentive to many surgeons to resort to abdominal section in these cases. He based his argument upon the high maternal and fetal mortality, quoting Simpson, and giving the maternal mortality in placenta previa as 40 per cent. He then went on to say: "I gather from the smothered confessions of other writers and the open admissions of my friends who have had a large obstetric experience, that it is really much higher; and in spite of the sound principles laid down for its treatment, it is probable that more than half the cases die."

Schwarz(2), of St. Louis, on the other hand, in 1912, four years ago, stated that no form of placenta previa, as such, ever offered a justifiable indication for Cesarean section.

In a symposium on placenta previa held in March, 1901, sixteen years ago, before the Philadelphia County Medical Society, I presented a short paper on "The Indications for Cesarean Section in Placenta Previa(3). This paper was prompted by my personal success with Cesarean section, chiefly for pelvic deformity. In it, I gave the maternal mortality in unselected cases as 25 per cent.; and in selected cases, as 5 per cent.—the fetal mortality being given as 75 per cent. The following conclusions were reached:

"I would recommend an immediate examination of all suspected cases under anesthesia, for the purpose of, first, confirming the diagnosis; secondly, determining the variety of the previa; thirdly, discovering the size and position of the fetus; fourthly, determining the condition of the cervix; and finally, affording a method for facilitating the introduction of the cervical and vaginal tampon. If hemorrhage appears before the viability of the child, if the previa is marginal, if the cervix is dilatable, and if the fetal heart is absent—then version or forceps may suffice. If, however, the child is viable, the placenta previa complete or partial, the cervix rigid, or the fetus transverse—then, in preference to other interference, Cesarean section would seem indicated."

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*Read before the Obstetrical Society of Philadelphia, March 1, 1917.

This paper elicited a liberal discussion, the majority of the speakers opposing my conclusions. B. C. Hirst stated that he had had twenty-four cases of placenta previa with one maternal death, and had collected, some years previously, more than one hundred cases, with but one death. He thought that this low maternal mortality did not justify Cesarean section. M. Price said that he did not consider Cesarean section justifiable. R. C. Norris agreed with those that had spoken, and said that he believed Cesarean section to be an unnecessary, and perhaps an unwarranted treatment. C. P. Noble mentioned the fact that all new propositions are apt to be judged either too favorably or too unfavorably, and said that he thought that this was about the status of the matter under discussion. Certain it was, he believed, that placenta previa should not be considered from the standpoint of the mother, except in cases of complete placenta previa.

Gillette, in 1901(4), stated that he approved of the Porro method of Cesarean section when there was great hemorrhage and probable sepsis, but advised the classical operation when the uterus contracted firmly and was probably not infected, and when the patient was in a condition to withstand the shock necessitated by a prolonged operation.

Donoghue(5), a surgeon, in January, 1901, reviewed the literature of the subject to that date. He stated: "Cesarean section, in certain cases of placenta previa, has a fairly well-defined standing. Its limits cannot, as yet, be accurately defined. At present, it seems that the conservative Sänger operation should be performed in cases of (1) complete previa; (2) previa in primipara, in the presence of severe hemorrhage or rigid os; (3) where there is a history of previous operative delivery; (4) in all cases of placenta previa where version is indicated if a reasonably skilled surgeon is available, and only an ordinary obstetrician. All these indications, he went on to say, are based upon the probable existence of a viable child (twenty-eight weeks of gestation, or upward).

Following these early papers approving of section, Ehrenfest (6) and Holmes(7), in 1902, published exhaustive papers on the impropriety of the operation. Holmes stated that this procedure lowers the fetal mortality to 30 per cent., and raises the maternal mortality rate nearly threefold. Approximately, therefore, the life of one mother is taken to save the uncertain existence of one baby. He says that "a rigid os is one of the rarest of complications in placenta previa, and that Cesarean section should be considered only as a *dernier resort.*"

In 1909, Harrison, Jewett, Fry, Newell and Grandin(8) contributed papers in a symposium on this subject. This discussion of these papers included remarks by Spencer, of London; and Hofmeier, of Wurzburg. It was the consensus of opinion that section is very infrequently necessary, as the obstetrician can usually dilate the cervix easily.

Foulkrod(9), in 1913, reported four cases of Cesarean section with one maternal death, saying: "I report these cases in an effort to bring about some plan whereby we can get definite results and statistics to prove whether or not the treatment is a good method."

J. B. Deaver(10) in 1916 advocated anterior transperitoneal hysterotomy and reports ten cases. Only one case, however, was at term. The average length of the duration of pregnancy at the time of operation was 4.7 months. The maternal mortality was *nil*, the fetal mortality was 43 per cent.

The latest important review of the subject took place at the Seventeenth International Congress, at London, in 1913, which I attended. Döderlein opened the Obstetric Section with a paper on placenta previa, embodying an extensive review of the maternal and fetal mortality. He stated that in Bavaria, from 1878 to 1907, a period of twenty-nine years, there were six million births, with 8729 cases of placenta previa, the majority of these patients having been primarily under the care of midwives. In these cases, the maternal mortality was 19 per cent.; the fetal, 50 per cent. The author then gave the statistics of cases reported by obstetricians in several countries (Germany, France, Italy, America, Scandinavia, Denmark, Russia and Finland)—a total of 5615 cases with a maternal mortality of 8 per cent. and a fetal mortality of 54 per cent. Next he analyzed the maternal and fetal mortality for the several methods of treatment, thus:

	Number of cases	Mortality	
		Mother, per cent.	Child, per cent.
Rupture of membranes	309	1.0	25
Braxton-Hicks	1434	8.0	74
Metreurysis	777	6.5	45
Abdominal Cesarean section	146	9.0	30

Döderlein favors Cesarean section, but feels that it should not replace the older methods entirely. He thinks that each case should be judged according to its merits. He considers despatch the main thing in the therapy. He believes that Cesarean section should not be performed if the child is dead; and when a simpler method would give the same results, no section should be done.

In the discussion that followed the reading of this paper, Veit stated that he favored section, and reported thirty-one operations with one maternal death. E. P. Davis also favored it, reporting fourteen cases with no maternal or fetal death. Bar, of Paris, and De Lee likewise approved of the operation. Kerr, of Glasgow, who had formerly condemned it, felt that it had its place. On the other hand, Nägel, of Berlin, Byers, of Belfast, and Cameron, of Glasgow, did not believe in it.

Placenta previa is fortunately not often encountered as an obstetrical complication. Lusk, years ago, stated that in the first 1000 confinements in the New York Emergency Hospital there was not one case of placenta previa recorded. It is difficult, however, to determine its frequency, some authors placing this at one in 1000 cases, and others at one in 300, while the records of the various maternities show that it may even be as frequent as one in 150 cases.

With the assistance of Dr. Samuel Axilbund, I have gone carefully over the records of the Philadelphia Lying-In Charity, and found that in 8697 cases, there were fifty-nine of placenta previa—one in 147. This high frequency is due to the fact that this institution does a large amount of emergency work.

In fifteen of the cases, the patients were primiparæ; and in forty-four, multiparæ. Six cases were of the central type (about 10 per cent.); and fifty-three, marginal and partial. The average length of gestation for a case was 7.3 months. Twelve of these women were at term—20 per cent. Seven mothers died—11.8 per cent. Of these seven cases, three were of the central type. All of the patients who died were exsanguinated on admission, and four of the seven were practically dying. These four should not, in fairness, be included in the mortality. If, then, we deduct these, the mortality rate will fall to 5 per cent.

The methods of treatment employed were tampon, metreurysis, manual dilatation and podalic version. In two cases, Cesarean section was performed by my colleagues, Drs. Hopkinson and Coles. Dr. Hopkinson's patient also had contracted pelvis. She was admitted after a profuse hemorrhage, and died on the day following the operation. Dr. Coles's case was of the central type, and was operated upon before there had been profuse bleeding. Both mother and child recovered.

The total fetal mortality was 79 per cent., but in these cases only 50 per cent. of the infants were viable.

At the Medico-Chirurgical Hospital, the records show that in 1085 cases treated, there were fifteen of placenta previa, with no maternal death. The fetal mortality, however, was 66.3 per cent. One patient was a primipara, and fourteen were multiparæ. There was one Cesarean section, performed by Dr. McGlinn. In this case there was profuse hemorrhage with signs of infection. For this reason, the Porro operation was done. The mother recovered, but the child died on the following day.

Taking the two institutions together, there were seventy-four cases. Leaving out of consideration the four women that were practically dead when admitted, the mortality in these cases was but 4 per cent.

It is apparent from the opinions gathered in this review of papers and recorded cases, that there still exists some disagreement as to the frequency with which Cesarean section should be performed. The most enthusiastic early advocates of the operation were abdominal surgeons, who naturally chose the abdominal route rather than the older methods, with which they were less familiar. Men of large obstetric experience, who are best qualified to determine the wisdom of a change in treatment, have either condemned the operation altogether or sought to restrict its application to the exceptional case. As remarked before, placenta previa is a rare complication in obstetrics; and only the physician with a large maternity-hospital service will have an experience sufficient to enable him to view the subject from a broad standpoint. The general practitioner who has not had this experience or the surgeon who is more familiar with abdominal surgery is not warranted in subjecting his patient to an operation that has a high mortality, when one less grave will suffice. Newell, of Boston, says: "The advocates of Cesarean section have not recognized that their personal limitations furnish the great indication for abdominal delivery, and not the exigencies of the case."

The views that I expressed in 1901, which I have already quoted in this paper (see p. 26), I still hold, in the main, to-day. It is interesting, however, to recall that during the last sixteen years, while in attendance upon three maternity services, and probably seeing my share of cases of placenta previa, I have not had any opportunity to perform Cesarean section for this condition. Twice I have had a case in which the procedure seemed to me wise, but in both instances the patient refused to have this operation performed. In one of these cases there was complete previa. This woman was a primipara at term. She had a rigid cervix, and had lost but little blood. It was necessary in this instance to dilate the cervix, boldly tear through the placenta, and do a Hicks version. I lost the infant, but the mother made a good recovery. I feel, however, that in this case both the infant and the mother might have been saved had a section been performed.

While a primipara at term, with complete placenta previa and a rigid os, is undoubtedly a proper subject for section, complete placenta previa in primiparæ is rare, and it is even rarer to find the cervix rigid. A more mature judgment has convinced me that Cesarean section is indicated only in the exceptional case. It has not reduced the maternal mortality, and the fetal mortality becomes of less moment when we consider the fact that only 40 or 50 per cent. of these infants are viable.

In speaking of Cesarean section in this connection, I refer to the classical operation only; as the other methods are all associated with great mutilation or hemorrhage. The Porro operation is mutilating, and ends the patient's procreative power; the extraperitoneal necessitates an incision through the maternal portion of the placenta, with its enormous sinuses; and the vaginal Cesarean, a variety of *accouchement forcé*, demands incision through the placental site, with consequent hemorrhage.

In regard to the mortality, we cannot, in my opinion, compare the mortality of Cesarean section when performed for placenta previa with its mortality when performed for pelvic deformity. The comparison must be made between the results secured by Cesarean section and those secured by the older methods of treatment in cases of placenta previa. According to Döderlein's paper, the older methods gave a maternal mortality of 5 per cent. and a fetal mortality of 48 per cent., while Cesarean section gave a maternal mortality of 9 per cent. and a fetal mortality of 30 per cent. Ordinarily, Cesarean section is not warranted unless the patient is in good condition and free from infection. These essentials are seldom present in cases of placenta previa. The initial symptom is hemorrhage, and this first hemorrhage may lower the vitality to such a degree that the patient immediately becomes a bad surgical risk. Then attempts to reach a positive diagnosis of the variety of previa, which are, of course, necessary, may occasion further bleeding and infection; so that, in the majority of cases, when the advisability of section is considered, it cannot be looked upon as a primary procedure. This explains the fact that Cesarean section when resorted to for placenta previa will always have a higher mortality than when performed for pelvic deformity. If the mother is willing to take a greater risk for the sake of her child, Cesarean section may be performed; but even then, I do not believe that the surgeon should be forced to operate against his better judgment.

It is the opinion of the majority of conservative obstetricians that a patient once operated upon by Cesarean section should be subjected to the same procedure in every subsequent pregnancy. Such a patient is apt to have adhesions; she does not bear well the stress of a long labor; and the danger of rupture is real. Holmes pertinently asks: "Can anyone imagine a more unhappy plight than that of a primiparous woman with a perfectly normal pelvis, who has been treated by Cesarean section for eclampsia or placenta previa, who is, and should be perforce, doomed in all her subsequent confinements to the same abdominal surgery?"

In 1901, I said that if the maternal mortality of Cesarean section for placenta previa were less, or even not greater, than that of the older methods of treatment, then, for the child's sake, it would be indicated in certain cases. My later work has, however, convinced me that the maternal mortality in Cesarean section for placenta previa is considerably higher than in the usual methods of handling this condition; and it does not appear justifiable to me to expose the mother to a greater risk on account of the child.

Moreover, Cesarean section does not necessarily mean a living child. Rigoir found that the mortality in infants following Cesarean section was 7.6 per cent.; and Bar, 5.6 per cent. There exists, also, in section the danger of incisional placenta previa, which may jeopardize the child's life. The chief causes of the high infant mortality in this condition are prematurity and a weakened and anemic condition. Ranken Lyle, in seventy cases, found only 40 per cent. at full term. Strassman, in twenty-three cases, found 39 per cent. at term, 42 per cent. premature, and 18 per cent. abortions. He concludes that no other method of treatment in placenta previa can ever promise, to any considerable degree, to reduce the fetal mortality. While Cesarean section is recommended for the viable infant only, the difficulty of measuring accurately the length of gestation, the size of the fetus, and the uncertainty of the fetal heart-sounds in these cases, make it very hard to say whether or not the child is living and viable.

Cesarean section, according to my judgment, has but one absolute

RECORD OF FIFTY-NINE CASES OF PLACENTA PREVIA, IN A TOTAL OF 8697 DELIVERIES TREATED AT THE PHILADELPHIA LYING-IN CHARITY.

No. of case	Date of delivery	Period of gestation	Pl. pr. centralis	Pl. pr. marginalis	Pl. pr. partialis.	Result to mother	Result to child	Method of delivery	Condition of patient on entering hospital
51 Prip.	7/10/91	6½ Mo.	......	1	....	Living	Dead	Tampon Pod. Ver.	Intermit. Hem. for 5 Days.
1579 Mltp.	7/9/96	Term	1	....	....	Living	Dead	Tamp. Forceps.	Very much Shocked from Loss of Blood.
1831 Mltp.	6/1/97	8 Mo.	......	1	....	Living	Dead	Mnl. Dl. Pod. Vr.	Sud. Profuse Hem., Shock.
2078 Mltp.	2/15/98	Term	......	1	....	Living	Dead	Tamp. Forceps.	Bldg. 3 Days Prior to Delivery.
2222 Prip.	8/3/98	4 Mo.	......	1	....	Living	Dead	Mnl. Dil. & Extrac.	Bldg. 2 Days Prior to Delivery.
2300 Mltp.	2/1/99	Term	......	1	....	Living	Dead	Tamp. Pod. Ver.	Prolap. Cord & Arm, Prof. Hem., Shock.
2532 Mltp.	10/27/99	8 Mo.	1	....	....	Dead	Dead	Pod. Ver. & Extrac.	Sud. Profuse Hem. 2 Hr. before Br't. to Hosp. Very much Shocked.
2538 Mltp.	10/30/99	8½ Mo.	....	1	....	Dead	Living	Pod. Ver.	Gr. Shock—Constant Bldg. for 1 Week.
2549 Mltp.	11/10/99	6 Mo.	......	1	....	Living	Dead	Pod. Ver. Forceps.	Bldg. 5 Days Prior to Entry.
2598 Mltp.	1/31/00	Term	......	1	....	Living	Dead	Pd. Ver. & Extrac.	Sud. Profuse Hem. & Shock.
2740 Mltp.	7/17/00	Term	......	....	1	Living	Living	Tamp. & Norm. Del.	2 Days Intermit. Hem.
2887 Mltp.	1/14/01	7 Mo.	......	1	....	Dead	Dead	Tamp. Pd. Ver. & Forceps.	Intermit. Hem. 5 Weeks Prior to Entry, very Great Shock.
2984 Prip.	5/16/01	6 Mo.	......	1	....	Living	Dead	Pod. Ver. & Forceps.	Sud. Hem. while Walking—Mod. Shock.

RECORD OF FIFTY-NINE CASES OF PLACENTA PREVIA, IN A TOTAL OF 8697 DELIVERIES TREATED AT THE PHILADELPHIA LYING-IN CHARITY.—*Continued.*

No. of case	Date of delivery	Period of gestation	Pl. pr. centralis.	Pl. pr. marginalis	Pl. pr. partialis.	Result to mother	Result to child	Method of delivery	Condition of patient on entering hospital
3059 Mltp.	8/6/01	8 Mo.	......	1	....	Living	Dead	Mnl. Dil. & Forceps.	Continuous Bldg. 2 Days.
3161 Prip.	12/28/01	7 Mo.	......	....	1	Living	Dead	Pod. Ver. & Extrac.	Sud. Hem. during Night Intermit.—2-Day Shock.
3374 Prip.	8/22/02	8 Mo.	1	....	....	Dead	Dead	Cesarean Section.	Gen. Contract. Pelvis, Prof. Hem., Shock.
3769 Mltp.	9/10/03	?	......	1	....	Dead	Dead	Pod. Ver. & Extrac.	2 Days Hem. Sud. Coll'ps. Imd. Aft. Birth of Child.
4358 Prip.	12/11/04	6 Mo. twins.	......	....	2 Placenta.	Living	Dead	Tamp. Pod. Ver. & Extrac.	Sud. & Prof. Hem., Shock.
4440 Prip.	3/5/05	Term	......	1	....	Living	Living	Tamp. & Forceps.	Continuous Blg. 24 Hours.
4468 Mltp.	4/13/05	7 Mo.	....	1	....	Living	Dead	Pod. Ver. & Forceps.	Shock-Bldg. Past 2 Weeks Intermit.
4505 Mltp.	6/3/05	6 Mo.	......	1	....	Living	Dead	Dil. with Hyd. Bag.	Bldg. Intermit. 2 Weeks before Admission.
4681 Mltp.	10/17/05	Term	......	1	....	Living	Living	Tamp. Norm. Del.	Sudden Hem., Mod. Shock.
4684 Mltp.	10/23/05	Term	......	1	....	Living	Living	Tamp. & Forceps.	Hem. with Each Pain during Labor.
4688 Mltp.	10/27/05	Term	......	....	1	Living	Living	Tamp. & Forceps.	Slight Hem. for Past Week.
4729 Prip.	12/8/05	6½ Mo.	....	....	1	Living	Dead	Tamp. Pod. Ver. Extrac.	Began Bleeding 3 Days Prior to Entering Hospital.
4887 Prip.	4/20/06	Term	......	....	1	Living	Living	Tamp. Norm. Del.	Profuse Hem. during Labor.
4931 Prip.	6/6/06	Term	......	1	....	Living	Living	Tamp. Norm. Del.	Profuse Hem. during Labor.

RECORD OF FIFTY-NINE CASES OF PLACENTA PREVIA, IN A TOTAL OF 8697 DELIVERIES TREATED AT THE PHILADELPHIA LYING-IN CHARITY.—*Continued.*

No. of case	Date of delivery	Period of gestation	Pl. pr. centralis	Pl. pr. marginalis	Pl. pr. partialis	Result to mother	Result to child	Method of delivery	Condition of patient on entering hospital
4962 Mltp.	7/4/06	8 Mo.	......	1	....	Living	Dead	Tamp. Pod. Ver.	Bleeding 10 Hrs. Prior to Delivery
4963 Mltp.	7/5/06	6 Mo.	......	1	....	Living	Dead	Tamp. Pod. Ver.	Sud. Profuse Hem.
5003 Mltp.	8/18/06	6 Mo.	......	....	1	Living	Dead	Pod. Ver. Extrac.	Intermit. Blg. since 6/28/06
5011 Mltp.	8/25/06	7 M.	......	1	....	Living	Dead	Tamp. Pod. Ver. & Extrac.	Sud. Hem. while Washing Clothes.
5082 Prip.	11/8/06	Term	......	1	....	Living	Dead	Tamp. & High Forceps.	Sud. Profuse Hem. and Shock.
5586 Mltp.	5/13/08	9 Mo.	......	1	....	Living	Living	Pod. Ver.	Sud. Hem. while Walking, Shock
5599 Mltp.	5/24/08	8 Mo.	......	1	....	Dead	Dead	Attempt to do Ver.	Patient Brt. in Practically Pulseless.
5807 Mltp.	8/5/08	9 Mo.	......	1	....	Living	Living	Tamp. Norm.	Ante-partum Hem., Shock.
6060 Mltp.	4/3/09	6 Mo.	......	1	....	Living	Dead	Pod. Ver.	Sud. Profuse Hem., Shock.
6072 Mltp.	4/9/09	9 Mo.	......	1	....	Living	Living	Tamp. Forceps.	7 Days Intertmit. Blg. Shock.
6260 Prip.	8/29/09	7 Mo.	1	....	....	Dead	Dead	Patient's Pulse Barely Perceptible, Attempt made to do Pod. Ver. Patient Died, before Placenta was Pierced. Brt. into Hospital after Sudden Profuse Hem.	
6264 Prip.	9/4/09	6 Mo.	......	1	....	Living	Dead	Induction of Lab. Ver. & Extrac.	4 Days Intermit. Hem., Shock.
6643 Mltp.	8/16/10	6½ Mo.	......	1	....	Living	Dead	Tamp. Pod. Ver.	3 Days Ante-partum Hem., Shock.

RECORD OF FIFTY-NINE CASES OF PLACENTA PREVIA, IN A TOTAL OF 8697 DELIVERIES TREATED AT THE PHILADELPHIA LYING-IN CHARITY.—*Continued.*

No. of case	Date of delivery	Period of gestation	Pl. pr. centralis	Pl. pr. marginalis	Pl. pr. partialis.	Result to mother	Result to child	Method of delivery	Condition of patient on entering hospital
6662 Mltp.	8/24/10	9 Mo.	......	1	....	Living	Living	Pod. Ver. Tamp.	13 Days Intermit. Hem., Shock.
6665 Mltp.	8/27/10	8 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	3 Days Ante-partum Hem., Shock.
6667 Prip.	9/2/10	8 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	2 Days Intermit. Bleeding, Shock.
6673 Prip.	9/8/10	5 Mo.	......	1	....	Living	Dead	Tamp. Pod. Ver.	Bleed for 42 Hr. Prior to Entering Hospital.
7131 Prip.	2/6/11	8½ Mo.	......	1	....	Living	Dead	Ver. & Forceps.	4 Days Intermit. Hem., Shock.
7146 Mltp.	2/17/11	9 Mo.	......	....	1	Living	Dead	Ver. & Forceps.	Sud. Profuse Hem. during Labor
7418 Mltp.	9/17/11	8 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	Bleed for 2 Days Prior to Entrance, Shock.
7716 Mltp.	5/9/12	9 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	Profuse Ante-partum Hem., Shock.
7816 Mltp.	6/30/12	8 Mo.	1	....	....	Living	Living	Coles Cesarean Section.	Hem. during Labor Profuse in Character.
8241 Mltp.	4/20/13	9 Mo.	......	....	1	Living	Dead	Tamp. & Norm. Del.	Intermit. Hem. 24 Hours.
8962 Mltp.	8/16/14	5 Mo.	1	....	....	Living	Twins Dead	Tamp. Ver.	Sudden Hem. with Shock.
8939 Mltp.	7/26/14	7 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	2 Days Intermit. Hem., Shock.
9049 Mltp.	10/14/14	8 Mo.	......	1	....	Living	Dead	Tamp. Pod. Ver.	Sudden Hem. 2 Hrs. Prior to Entrance.
9101 Mltp.	10/30/14	5 Mo.	......	1	....	Living	Dead	Incision of Ant. Lip of Cervix.	Intermit. Bleeding Especially at Night Last 3 days.

RECORD OF FIFTY-NINE CASES OF PLACENTA PREVIA, IN A TOTAL OF 8697 DELIVERIES TREATED AT THE PHILADELPHIA LYING-IN CHARITY.—*Continued.*

No. of case	Date of delivery	Period of gestation	Pl. pr. centralis	Pl. pr. marginalis	Pl. pr. partialis	Result to mother	Result to child	Method of delivery	Condition of patient on entering hospital
9575 Mltp.	8/29/15	6 Mo.	......	1	....	Living	Dead	Pla. Pierced with Fingers & Foot brought Down.	Sudden Hem. while Walking. Moderate Degree of Shock.
9743 Mltp.	1/2/16	6 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	Hem. after Rest in Bed due to Previous Hem.
9804 Mltp.	2/10/16	7 Mo.	......	....	1	Living	Dead	Tamp. Pod. Ver.	Patient Treated Outside by Tamp. Continuous Bleeding 2 Days. Considerable Shock.
9809 Mltp.	2/14/16	6 Mo.	......	1	....	Living	Dead	Internal Ver. & Extrac.	3 Days Intermit. Bleeding.
9828 Mltp.	2/29/16	9 Mo.	......	1	....	Living	Dead	Tamp. Norm. & Forceps.	Considerable Bleeding during Labor Pains.

indication as an obstetrical operation, namely, pelvic deformity of great degree. In all other conditions, the operation is indicated only in the exceptional case. I have not performed Cesarean section in placenta previa during the last sixteen years, because rigidity of the cervix and complete previa are rare and, when they are found, the patient's general condition usually does not warrant section.

Only time and the experience of the obstetrician will place Cesarean section where it rightly belongs, and the profession should await this decision. It is my opinion, however, that its use will be restricted proportionately to the better attention the physician gives to the pregnant woman and his keener appreciation of the magnitude of even slight antepartum hemorrhage. He will then be able, in a given case, to act promptly before the patient is exhausted. And will find it sufficient, as a rule, to resort to a method of treatment less serious than is Cesarean section.

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THE TREATMENT OF PLACENTA PREVIA; THE MORE CONSERVATIVE METHODS.[1]

BY

J. O. ARNOLD, M. D.,

Clinical Professor of Obstetrics, Temple University Medical School; Associate Obstetrician, Samaritan Hospital,

Philadelphia, Pa.

If I have correctly understood my instructions, it has been assigned to me to discuss the methods of treating placenta previa in those cases not suitable for accouchement forcé, or Cesarean section.

I wish to say at the outset that I believe in, and practise Cesarean section for a certain limited number of cases of placenta previa, and likewise, accouchement forcé.

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[1] Read at a meeting of the Philadelphia Obstetrical Society, March 1, 1917.

This, I think, is the ground taken by most practical obstetricians. The only question is, as to where the limit shall be drawn, in separating one group of cases from another.

The preceding speakers have defined this limit as they see it. Whether we all agree with them or not, or whether one obstetrician would extend the scope of any given method to a much larger group of cases than another, must depend largely upon individual judgment and experience. It must also depend in no small measure upon the facilities, the circumstances and conditions under which different obstetricians meet most of their cases. No one can decide such matters by mortality tables, or other men's statistics. But, it is equally true, that no one has a right to ignore the reports and statistics of those of larger experience. Hence we welcome the papers that have just been read.

I take it that one of the purposes of this symposium, if not its chief purpose, is to try to render some helpful service to the general practitioner, for he is still the prevailing obstetrician.

Most cases of placenta previa are seen first by the physician in general practice, and it has been very well said by Sir Haliday Croom of Edinburgh, that "a woman's chances for recovery from placenta previa, rest chiefly with the man who sees her first."

This is undoubtedly true with regard to sepsis, and it is almost equally true with regard to hemorrhage.

It is well, therefore, in whatever discussion we have on this subject, that the family physician be kept in mind, and that we do not lose sight of the circumstances and conditions under which he must work, for such circumstances and conditions make of the treatment of placenta previa, a far different problem, in most instances, from that met by the obstetric specialist in the well-equipped hospital.

Of course it may be said that all cases of placenta previa should be treated in a suitable institution. No one will seriously dispute this proposition.

Painless hemorrhage, occurring in the last three months of pregnancy is always a positive indication for placing the patient in a hospital, if it is at all possible to do so; or for instituting active treatment under the best conditions that can be commanded at home, if hospital facilities are not available.

Many grievous mistakes have been made by not believing in, or not acting on, this indication.

In looking over my own records of consultation cases for the last few years, I find that in over 50 per cent. of them, the family doctor had not heeded the first hemorrhage: at least, not to the extent of taking the patient to a hospital, or otherwise instituting active treatment; and as some one has said, "there is no expectant treatment for placenta previa."

But it is not always possible to have every patient in a hospital, or even under the best of home conditions when treatment must be undertaken. Especially is this true, when the first hemorrhage is profuse and continuous. In such cases something must be done at once, and done by the physician who is first called. What can he do? What should he do? These are the practical questions, which, as I understand it, we are to try to help him to answer. Certainly he will not do Cesarean section. That method of treatment is practically out of the question, unless, or until the patient is in a hospital. Accouchement forcé may be undertaken. It is not an impossible thing to do in the home, but surely no one will deny that in all but a very few cases, it is by far the most dangerous thing to do under such circumstances. The introduction of a suitable elastic balloon bag, which has met with great favor and success among many obstetricians, is likewise out of the question here, for in such an emergency the physician is seldom or never equipped for this method of treatment. There remains then, but one of two things that he can do, unless he is content to do nothing until the arrival of expert help. He can either do version, with a view to controlling the hemorrhage by pressure of the breech, or he can tampon the vagina with cotton or gauze.

Tamponing is the thing that will usually be undertaken. And in my opinion it is the thing that should be undertaken, in the majority of cases, notwithstanding its rather general condemnation.

If version is attempted before dilatation is complete (and it never is complete at the time of this first treatment), it should be, of course, by the Braxton-Hicks bipolar method, and this is not at all an easy thing for the comparatively inexperienced family doctor to do. I think I have never known bipolar version to be done, under such circumstances, by the general practitioner. Those who attempt to do it, or who think they are doing it, usually do the internal podalic version; and then they hastily complete delivery, and this amounts to accouchement forcé, with all its dangers.

In the vast majority of cases dilatation, at the time of the first hemorrhage, will be far from complete, and the introduction of more than two fingers, will be a dangerous procedure, unless the placenta is some distance from the os, and in such cases there is seldom any need of version. A simple rupture of the membranes, with stimulation of uterine contractions, is sufficient.

I am sure I need not stop to explain why any method is dangerous that requires the rapid dilatation of the peculiarly friable placenta previa os.

Next to intrapartum hemorrhage as the cause of the greatest number of deaths in placenta previa, is postpartum hemorrhage from lacerations of the lower uterine segment resulting from unwise attempts to do rapid dilatation. It has been my misfortune to have known of so many deaths from this cause, that I almost look upon this form of treatment as worse than the disease itself.

Apropos of this point, I recall a most impressive remark made by Wagner, the chief obstetrician of the Wertheim clinic in Vienna. I had just examined a bleeding woman, and had reported to the chief as he made his rounds, that it was a case of marginal placenta previa. I think, perhaps, I had raised the question of immediate delivery, at any rate his instructions were, rupture the membranes and let her alone. And then with a significant shrug of his shoulders he added, "I have seen over thirty thousand deliveries since I came to this clinic, and I still shudder at the sight of a case of placenta previa. Not only do I shudder, but I fear and tremble for that woman's safety, whose accoucheur attempts delivery by rapid dilatation of the os." The true import of this remark became all the more evident, when only a few days later, in another clinic, I saw a woman die from postpartum hemorrhage, a few hours after accouchement forcé done for placenta previa. I may say in passing that the two Frauenkliniks of Wertheim and Schauta, at the time to which I refer (more than three years ago), gave an excellent opportunity for comparing the results of at least two of the more conservative methods of treating placenta previa. Situated as they are, side by side, in the same institution, each with three or four thousand cases a year of the same class of patients, it was possible to make fair comparisons.

The Schauta clinic gave first place to bipolar version, occasionally using the balloon bag, and very rarely or never resorting to Cesarean section, while the Wertheim clinic enthusiastically gave first preference to the bag method, with tampon or version as second choice, and Cesarean section a rarely accepted third.

The maternal mortality was practically the same in both clinics, running about 6 per cent. or 7 per cent.—while the fetal mortality by the bag method was claimed to be from 10 per cent. to 15 per cent. lower than by version, which was admitted to be as high as 60 per cent. to 75 per cent.

And this record, so far as I can gather from the literature has been, found to be generally true with reference to these two widely used methods of treatment. The weight of authority seems to be about equally divided.

Many good men prefer version and perhaps just as many use the bags. The average mortality for mothers appears to be about 8 per cent. for both methods, while the fetal mortality it is admitted is fully 75 per cent. in version and about 55 per cent. where the bags are used. This, of course, means treatment by skilled obstetricians, and chiefly in maternity hospitals.

But to return to the question of treatment by the first physician to see the case.

I intimated awhile ago that I believed that tamponing was not only the first and most practical thing to do, in the majority of cases —but the best thing to do—if done right. If this be true, is it not, then, the duty of the trained obstetrician to help the general practitioner to know how to do this most practical thing in the safest and most efficient manner?

Besides being the quickest, and most available method of checking hemorrhage, the properly applied tampon has certain other advantages that are not to be overlooked.

(1) As is well known, it is one of the best aids to dilatation of the os. This is true not only in placenta previa but wherever the os remains thick and unyielding. The big problem in placenta previa is not how to deliver the child, but how to secure full dilatation of the os, and to secure it with the least possible hemorrhage and traumatism. When this is once accomplished, whether by natural or artificial means, the further treatment is a comparatively simple matter.

My contention is, that time alone will safely dilate the os and that the tampon, in the majority of cases, is the most practical means for gaining time, with the least amount of hemorrhage.

(2) If the membranes are ruptured before packing, as they always *should* be, the tampon becomes a very efficient stimulus to uterine contractions, and this of course is an essential step in getting dilatation.

(3) If from repeated hemorrhages, or other cause, the patient's condition is desperate, tamponing is the least dangerous method of securing time enough to react and restore her, before adding the shock of delivery, or incurring the danger of postpartum hemorrhage.

(4) If the patient is to be removed to a hospital, or if assistance is to be waited for, tamponing is the only practical temporary treatment.

Some of the objections to the tampon are (1) that it increases the danger of sepsis; (2) that it sometimes fails to control bleeding, and (3) that it may cause considerable pain and discomfort.

Morphin and atropin, or morphin and scopolamin will usually enable the patient to bear the pain, and these drugs would often be indicated anyway, to stimulate the pulse and quiet excitement and shock from the hemorrhage through which she has just passed.

If tamponing does not control the hemorrhage, it is probably because it is too hurriedly, and therefore inefficiently done. It does not pay to hurry in the treatment of placenta previa, no matter what method of treatment is selected. The hasty jamming of a yard of gauze into the vagina does not constitute tamponing as we are now discussing it.

The packing must be done deliberately—and under an anesthetic wherever possible. The palmer surface of the gloved hand is the ever-ready and best speculum, over which squeezed-out pledgets of cotton or gauze are carried by means of the dressing forceps, not into the os, but around it, as high in the vaginal fornices as the finger tips can press it, and this is backed up by completely filling the vagina, piece by piece in the same manner, and placing over the vulva, suitable pads and a T-binder; while the uterus is held down from above by a tightly drawn abdominal binder. It may take a little longer to do it this way, but it means the difference between success and failure, often between life and death.

As to the objection that the tampon may increase the danger of septic infection, no one will deny that this is true. But I believe it to be equally true that this danger is far less now, than it was in the past.

Modern obstetric facilities and the application of modern principles of asepsis, have done a great deal in recent years to *rid* this time-honored method of much of its former potential danger. And therefore, I raise the question whether we may not have unjustly condemned and neglected an efficient and highly practical procedure, because of its unsavory history, rather than because of its present faults.

Personally I resort to the tampon with every reasonable assurance, for I feel that we are now able to pretty effectively remove the chief factors that constituted its former sources of danger. These were (1) failure to appreciate and apply surgical cleanliness in obstetrics; (2) unsuitable packing material, and faulty technic in the whole procedure of placing the pack, and (3) allowing the pack to remain too long in place.

There is no longer any excuse for not having suitable packing material, for every doctor may now carry the handy packages of aseptic gauze or cotton.

Sterile gloves and comparatively thorough cleansing of the external genitalia and vagina, can practically always be had, even in the presence of free bleeding. And following the invariable rule of rupturing the membranes before packing—and if necessary, using pituitrin, or other uterine stimulation to establish and maintain labor—the time for keeping the tampon in place may be so shortened that the danger of infection is reduced to a minimum or at least to a point where it compares favorably with the dangers incurred by any of the other methods, for none of these are free from all danger along this line.

A brief case-report or two, by way of illustration, may help some one in deciding what method to choose; for the deliberate selection of the most suitable method for any given case—like the deliberate carrying out of that method, is a large factor in the successful treatment of placenta previa.

Case I.—A primipara, aged thirty-one, began to have profuse painless bleeding at about seven and one-half months. Her physician kept her in bed three or four days. The hemorrhage gradually lessened, but did not entirely cease. The patient again went about her household duties. Two weeks later (Feb. 14, 1917), she awoke in a flood of blood at 1.00 A. M. She had two subsequent hemorrhages before I saw her. I found the os barely patulous, with the placenta easily felt. The fetal heart sounds were comparatively good and there was no apparent disproportion.

Tamponing was therefore decided upon. Under light chloroform anesthesia, the membranes were punctured, the vagina packed, and binders applied as above described. Labor soon became active and severe, and the patient was given morphin and scopolamin. She was watched constantly for six hours, when the removal of the packing was followed at once by the spontaneous birth of the child, with very little loss of blood. Mother and babe are making a perfectly normal convalescence.

It might be claimed that the tampon worked well here, because it was but an easy marginal case.

Case II was different.—A para-xii, aged forty. History of antepartum hemorrhage in two other pregnancies. Also a history of twins once before. At the beginning of her ninth month she suddenly began to bleed while on the toilet. When I saw her a half hour later, she had gone to bed and the hemorrhage had temporarily ceased. The external genitals and vagina were cleansed, and upon examination I found the os about one-third dilated and completely covered with placenta. I punctured the placenta as far to one side as possible, and tightly packed the vagina in the manner above described. There was free bleeding for a moment when my finger penetrated the placenta, but none after the packing. Uterine contractions began shortly, and were further stimulated and kept active by $\frac{1}{2}$ c.c. doses of pituitrin at about two-hour intervals. I remained constantly at the bedside for six hours, or until I felt assured that the labor had progressed to full dilatation. In the meantime a diagnosis of twins was made. Chloroform was given, the packing removed, and dilatation found to be complete. Rapid delivery by internal version (both heads presenting) resulted in living babies with but little shock or loss of blood. Mother and babies made normal recovery.

CASE III.—Shows the value of the tampon when the patient is *in extremis*. A para-ii, aged thirty-nine. Within two weeks of term was brought to the hospital almost exsanguinated and pulseless, having flooded profusely on two successive days. There was but small dilatation, and barely room to get past the placenta to rupture the membranes. No evidence of fetal life. Tamponing and binders completely controlled the bleeding and stimulated contractions. Constant attention for the next seven hours, with hypodermoclysis and other methods of restoration was required to place the patient in condition to justify further manipulation.

Under light ether anesthesia, the packing was removed, dilatation found to be complete, and the child delivered by version with little or no further loss of blood. The puerperium was afebrile and involution normal. Incidentally, however, it may be of interest to note that on the fourth day after delivery with patient's general condition otherwise satisfactory, she became wildly maniacal. This condition of puerperal insanity due to the profound anemia, lasted with varying severity for about two weeks, then gradually subsided, and at the end of a month the patient had entirely recovered.

CASE IV.—Illustrates the use of the elastic bag as a tampon and dilator. Mrs. C., multipara, aged twenty-eight, about seven months pregnant. Had painless bleeding for two days, one month before. The second hemorrhage came suddenly and in large amount at 4.00 A. M. By the time a physician could be obtained, the flow had nearly ceased, and she was sent to the hospital without packing. I saw her soon after, and found a thick os, dilated to about two fingers, with the placenta apparently covering half the lower uterus and os. There was no evidence of fetal life.

The membranes were ruptured, and a Voorhees bag inserted which completely controlled the bleeding. Labor began soon, and in about two and one-half hours the bag was expelled, and delivery accomplished at once by version. There was no further bleeding, and the mother made a rapid recovery.

CASE V had still different features, and illustrates the method by bipolar version. Mrs. K., a para-iii, aged twenty-eight. Within two or three weeks of term. With no pain or sign of labor she suddenly had a flood of blood and called a nearby physician, who put her to bed, packed gauze in the vagina, and left. About five hours later, there was another profuse hemorrhage, and the patient was sent to the Samaritan Hospital. Here I found the os less than half dilated, with central placenta previa and the patient in extremely bad condition. It was evident that bipolar version would be the quickest method of stopping the flow of blood, consequently I at once punctured the placenta with two fingers and with the external hand pushed down a foot, which was brought out until the breech effectively controlled the bleeding.

Time was taken to restore the patient, after which instead of making traction on the child's leg, uterine activity was stimulated by small doses of pituitrin, and after several hours, the normal forces were thus made to complete the delivery, with no more hemorrhage, and but little injury to the cervix. The child, of course, was dead, but the mother made a rapid recovery.

Or as an illustration of the type of case, in which I believe the Cesarean operation, at times, to be the method of choice, I may be permitted in closing to briefly report:

CASE VI.—A primipara, aged thirty. Began to have painless hemorrhage at seven and one-half months. Had been bleeding more or less continuously for two or three days, when I saw her. On examination I found the os barely patulous to the finger tip, and surrounded by placenta. The patient was an extremely nervous woman, rather frail, and below the average in size. The child was alive and its safe delivery was a paramount desire with the parents and family friends. Cesarean was proposed, as offering the best chances for the child and at least as good chances for the mother, as any other method. Operation was accepted and mother and child made good recovery, and are both in splendid condition at this time, five and a half months later.

These reports are given, not as a series of cases, but as types of cases suitable for the various methods of treatment.

4149 NORTH BROAD STREET.

THE *PROS* AND *CONS* OF ACCOUCHEMENT FORCÉ IN PLACENTA PREVIA.*

BY

ALICE WELD TALLANT, M. D.,

Philadelphia, Pa.

FEW mistakes in the realm of medicine are more disastrous than the attempt to manage cases by rule of thumb and put forward a single method of treatment as suitable in spite of varying conditions. For that reason I wish to make my position clear at the outset by assuring you that the title of this paper was chosen with premeditation and that I am quite as much interested in the *cons* as in the *pros* of the matter.

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*Read before the Obstetrical Society of Phila., March 1, 1917.

Accouchement forcé is often thought of as synonymous with artificial dilatation of the cervix, but strictly speaking the operation involves two distinct steps, first the dilatation of the cervix and then, immediately following that, the extraction of the child. This apparently simple and self-evident point is worth remembering, since the probable ease or difficulty of the extraction should be an important factor in the decision for or against this procedure. It should also be remembered that other factors enter into the success or failure of the operation, according as the cervix is partially dilated or closed, labor actively under way or not yet begun, and the patient at term or not. Furthermore, in applying this or any other method of treatment to placenta previa we shall find that the variety of placenta previa has a very real part to play in determining our choice of a method. And lastly, the condition of both mother and child must be taken into account before we decide what is best to do.

What are the methods of dilating the cervix artificially and which, if any, are applicable to placenta previa? They have been conveniently grouped under two heads, stretching and cutting. Stretching of the cervix may be accomplished by the hand, a metal dilator or one of the various types of rubber bag. The cutting operations comprise the deep, so-called Dührssen incisions and the more radical vaginal Cesarean section. We can dispose of the last two without more ado by stating that they are distinctly unsuitable for use in the vast majority of cases of placenta previa. The tissues of the cervix and lower uterine segment are so much softer and more vascular than under normal conditions that any incision is bound to be followed by unusual hemorrhage, which obscures the field of operation besides adding fresh danger to a patient who has already suffered from more or less bleeding. The friability of the tissues also makes satisfactory repair more difficult. From the three stretching methods we may rule out instrumental dilatation. Even in the days of its greatest vogue the Bossi dilator was considered dangerous in placenta previa on account of the deep tears which resulted in spite of the greatest care.

The subject of this paper has, therefore, rapidly narrowed itself down to a discussion of the dilatation of the cervix by the hand or the bag, followed by the extraction of the child. Under what circumstances will such a procedure give good results, and when is it to be avoided?

The most favorable combination of circumstances for accouchement forcé would be offered by a multipara with a partially dilated cervix, a variety of placenta previa other than central, and no disproportion between the child and the pelvis. It is true that in many such cases all that is needed is to rupture the membranes. The head then comes down and acts as a tampon, and labor may progress normally without other interference. This is perfectly good obstetrical treatment when mother and child are in good condition, but if the hemorrhage is not controlled by the descent of the presenting part, we must be ready to complete dilatation and delivery. Moreover if there has been considerable hemorrhage so that the child is plainly in danger and more rapid delivery is necessary, accouchement forcé may be indicated.

The manual dilatation of the cervix may sometimes be satisfactorily accomplished, even in a primipara, if the cervix is obliterated and partially dilated, and in a multipara, even though not in labor at all, if the cervix shows the average amount of dilatation and is sufficiently yielding. Manual dilatation is sometimes made easy in these cases by the softening of the cervix, which is often characteristic of placenta previa. This fact should not blind us to the danger of lacerating the cervix by too rapid manipulation, yet on the other hand we must often work fast in order to complete the delivery before there has been too much bleeding.

As an example illustrating some of the above points the following case might be cited:

Mrs. S., para-vii, was admitted to the Maternity of the Woman's Medical College, with a history of intermittent bleeding for about three weeks. She had bled for about three hours the night before her admission and had finally called a midwife, who packed the cervix and vagina. Incidentally I am glad to testify to the aseptic technic of this midwife, as the patient had no sign of infection during the puerperium. The patient was admitted with a pulse of 130; she was not in labor, but the cervix was about three fingers dilated; the placenta covered the internal os, but was not actually of the central variety. Dilatation was completed manually with little difficulty, the membranes ruptured and the hand introduced into the uterus with the intention of performing version. The cord was found to be barely pulsating and as the head had descended into the superior strait with the passage of the fluid, axis traction forceps were at once applied and the child easily extracted, as it was not large, weighing only 6 pounds. The mother seemed to collapse somewhat after delivery, but soon responded to stimulation; the child was resuscitated with some difficulty.

If the cervix offers enough resistance to make us fear a laceration from the use of the manual method, a rubber bag may be introduced, a weight attached and perhaps some additional traction used to hasten dilatation. A bag makes an even pressure and is, therefore, less likely to tear the cervix than the hand is, even when traction is employed, and it also acts as a tampon during the dilatation. We must make a distinction between this use of the bag for accouchement forcé and its introduction simply to induce labor.

Since dilatation of the cervix is to be followed by immediate delivery, we must be even more than usually careful to have the dilatation of the cervix absolutely complete before beginning the extraction, as the passage of the head through an imperfectly dilated os almost surely means laceration of the soft tissue. The danger of laceration is greater, of course, if the child is large or if the birth canal is so rigid as to make extraction difficult. Such tears at best cause unnecessary bleeding, at their worst, by extension into the lower uterine segment they may end in rupture of the uterus.

The danger of lacerating the cervix is somewhat less with a forceps delivery than with version and extraction. In the former case the child's head as it is drawn down by the instrument may so control the hemorrhage by direct pressure that extraction can be slow and the dilatation, if not enough to allow the easy passage of the head, may occasionally be increased by gentle traction—although this is a dangerous procedure except in the most skilful and experienced hands. In version, on the other hand, there may be very considerable hemorrhage during the turning of the child in the uterus, so that the delivery must be hurried in the interest of both mother and child. Even without this added complication we know that the extraction of the after-coming head must not be delayed beyond the classical eight minutes, and if a rim of cervix still persists, it is likely to be torn in our efforts to finish the delivery before the child is asphyxiated. I have seen such an accident during the birth of a large full-term baby through a normal pelvis. Indeed it may be said at this point that in cases of disproportion, accouchement forcé has no place.

Thus far we have been considering the subject on the supposition that the child is viable and in sufficiently good condition to warrant efforts to save its life. If the child is not viable, accouchement forcé would be performed, of course, solely in the interest of the mother, when the hemorrhage had been so profuse as to necessitate immediate emptying of the uterus. If the mother has not lost enough blood to be endangered by a longer labor, more conservative methods come into play, as the Braxton-Hicks method of tamponing the bleeding part with the child itself or the insertion of a bag to induce labor.

When accouchement forcé must be used to deliver a nonviable or premature infant, we may be comforted by the thought that a small child may often be safely extracted without any laceration of the parts, even though the dilatation of the cervix is not absolutely complete, and that on account of its small size the delivery will be quick and easy.

We come now to the cases of undilated or rigid cervix, especially in primiparæ, where the attempt at rapid delivery by accouchement forcé may be fraught with grave danger, the more so if the implantation of the placenta is central or nearly so. To tear through the cervix in the effort to save the child usually spells death for the mother, and an occasional fortunate termination may probably be attributed more to good luck than to good management. These cases are practically all outside the province of my paper, except as they constitute a large class of *cons.* According to varying conditions, some will require the most conservative treatment and others the most radical (as Cesarean section is often called, although it may really be the most conservative method for the given case). These methods of treatment will be described in the papers which follow mine.

I trust that in what I have said on this subject I succeeded in making my position clear. Accouchement forcé, used rashly and unadvisedly without considering the points of the individual case, may be a ghastly and death-dealing maneuver. In suitable cases, on the contrary, it is to be valued as a life-saving measure for both mother and child, and one which should not be lightly disregarded.

1200 SPRUCE STREET.

THE INTERMEDIATE REPAIR OF THE INJURIES OF THE GENITAL CANAL IN CHILDBIRTH.*

BY

BARTON COOKE HIRST, M. D.,
Philadelphia, Pa.

THE subject chosen for this evening's discussion, I think, is worthy the attention of the two most prominent local societies in America devoted to obstetrics and gynecology.

It must have been noticed of late years, that there has been a pause in the progress of gynecology. Further progress must take a new direction, it cannot come from the old type of so-called gynecologist who knows nothing except the surgical treatment of diseases of women most of which are preventable and have become inexcusably chronic; it cannot come from the type of obstetrical specialist too prevalent in this country—a mere man-midwife. It must come from a closer correlation in the study of obstetrics and diseases of women. It is this kind of study that must solve the largest question in this branch of medicine still awaiting solution.

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* Read before a Joint Meeting of the New York and Philadelphia Obstetrical Societies, April 10, 1917.

If any specialist analyses his case books, he will find that more than half the women who consult a physician on account of something peculiar to their sex, are suffering from the effects of lacerations of the genital canal. And yet for more than a generation the primary repair of these injuries has been a universal practice. There must be something wrong, therefore, with prevailing methods; else why should such an enormous number of women be more or less incapacitated from these injuries that have been already primarily repaired? Surely a method tried for more than a generation and exhibiting such results must be pronounced a failure. The question naturally suggests itself: "Why then should a method tested so long and so extensively be persisted in if it is not successful?" The continuance of this old practice is due in great part to the teaching of our professors of obstetrics. Almost without exception, the text-books on obstetrics published in this county still advocate the immediate repair of the injuries of childbirth. And yet the very men who advocate this practice must have seen innumerable failures in their own hands and must have witnessed many more in the hands of others.

Another reason for the persistence of this practice is the difficulty of properly repairing the injuries of childbirth. A patient does not like to be anesthetized again some days after her delivery; the general physician has not been taught to do this work properly; he does not possess the necessary implements; perhaps cannot command the assistance required; and feels that for the remuneration received, he cannot afford the time and trouble for this work. But are these objections to the newer practice valid? Personally I do not consider them so.

It is apparent to anyone it seems to me, that the old practice must continue to have the same enormous proportion of failures in the future that it has had in the past. What man of good surgical judgment or sufficient surgical experience could expect a satisfactory result from plastic surgery done immediately after a child's birth; with the field of operation obscured by a profuse bloody discharge;

with the operation conducted on a bed; with insufficient light; insufficient assistance; and possibly insufficient implements; with the tissues bruised, pulled awry and distorted. What possibility is there of a correct diagnosis under these circumstances; of a distinction between the laceration of the cervix; the lacerations of the two layers of the triangular ligament; the lacerations of the levator above these layers; of the deep transversus perinei and the compressor urethræ between them; of the structures in the perineal center or body; of Colles' fascia; and perhaps of some of the fibers of the sphincter and of the other muscles under Colles' fascia, the superficial transversus and the bulbo-cavernosus?

Has not the time arrived to change the old teaching? Has not the general public a right to expect something better of us specialists than a persistence in the old plan of practice which has been demonstrated to be a failure? Ought not the profession in general to look to us for better teaching and advice than we have been giving them in the past? I am profoundly impressed with the belief that this change must occur, and that if the specialist of to-day does not perceive the necessity for this improvement in his work, he will be superseded by more progressive men who do appreciate the necessity for it.

The next question that naturally presents itself, is: "How are we to improve in this matter?" For the first ten years of my practice, I pursued the old plan of immediate repair which I had been taught and which all my colleagues were practising, but in the course of time I accumulated some very disagreeable experiences. I was often obliged to tell my patients that they needed a repair when I had already made one and frequently heard of my patients falling in the hands of other physicians who told them that a repair was necessary, although they had been in the hands of a specialist claiming to be an expert who had made a primary repair. I finally became convinced that this sort of work would not do; that if my results were so unsatisfactory, my claim to be an expert was a sham. I then began experimenting with different periods of repair and have finally for the last twelve or fifteen years settled upon the practice of making all these repairs that are at all extensive, a week after the baby's birth; since which time all my difficulties have disappeared. When such a repair is made upon one of my patients, or in my services, it is never necessary to suggest a subsequent repair to that patient nor can she be told truthfully by any other physician that she requires additional patching up of the genital canal.

I have selected the conventional period of a week because it is impracticable to repair the cervix under five days after childbirth on account of the danger of infecting the endometrium. And besides I find that at the end of a week, an accurate diagnosis of all these injuries is perfectly practicable; not only of the cervix, but of all the structures in the anterior vaginal wall including the supports of the bladder and of all the structures composing the pelvic floor and perineum.

This practice has been carried out for some fifteen years in all classes of patients: in my private patients, in my hospital services and in my out-patient department, in the homes of the poorest class of people. And in all these individuals this method of repair has proved equally satisfactory.

Has not the time arrived, therefore, for us to try something better than the older methods? They are unquestionably a failure. Otherwise, how could one explain the fact that more than 50 per cent. of gynecological patients are suffering from the effect of injuries to the birth canal; why is the office of every gynecologist crowded with women who consult him on this account; these private patients having previously been in the hands of well-educated physicians who have almost always practised on them a primary repair, but usually with a total or comparative failure?

Will the general public be satisfied with this sort of work indefinitely? And is the profession content to continue a futile procedure necessitating the subjection of their patients to a second operation to atone for the inefficiency of the first attempt?

1821 SPRUCE STREET.

THE IMMEDIATE REPAIR OF THE INJURIES OF PARTURITION.*

BY

WILLIAM POHLMAN POOL, M. D.,

Brooklyn, New York.

IT seems like presumption to attempt to suggest any modification of an obstetric law laid down by Dr. Hirst, and formulated from his vast experience, and what I have to offer is not so much as an amendment to his statute, as the expression of what has been my own belief and practice.

From a purely technical position, there can be scarcely any question of the value of Dr. Hirst's method of treating the wounds of parturition, backed up, as it is, by his results in so large a series of cases. But from the utilitarian point of view, which we are compelled to take into account in our work, and particularly in what we teach the student, may there not be a question of its practicability as a routine? I doubt that I could induce all my obstetric patients to submit, within a few days of the delivery, to a second anesthetic and a second surgical procedure, with all that it involves in the home, and I am very sure that the average young practitioner, who finds himself obliged to conduct many of these cases under conditions that are far from ideal, and for a consideration that is nominal, could not do so.

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* Read before a Joint Meeting of the New York Obstetrical and Philadelphia Societies, March, 1917.

I have not been accustomed to follow this rule undeviatingly, but have tried to classify my cases into those in which immediate repair may be done, and those in which delay is indicated.

Practically all the standard obstetric text-books dismiss this subject with a few lines' notice, and merely call attention to the obvious disadvantages of attempting to suture these wounds at the close of labor, when the light is poor, when assistance is inadequate, when the general condition of the patient is bad, when there is an abnormal amount of bleeding, or when the parts are distorted by edema. There is also comment upon the nature of the wound, but little attempt seems to be made to differentiate its character and extent, except by putting it in the class of the first, second, or third degree.

To my mind, in deciding this matter, the degree of the tear is of less importance than its character in other respects: Whether it be straight and clean-cut, with smooth surfaces, or whether it be zig-zag and irregular, with surfaces that are pulled out and frayed. The injury is due to prolonged or forcible pressure upon the tissues of the floor and outlet, and it occurs where the pressure is greatest, or at the point that is relatively weakest, no matter whether the tissue at that point be muscle or fascia or tendon. The tear runs, by preference, in the direction of the fibers of the structure injured, for the reason that it is easier to split tissue than to pull it apart. Hence the majority of moderate puerperal lacerations are straight and even. But by reason of the complex arrangement of the structures that make up the perineum and pelvic floor, a laceration which begins straight, cannot continue very far without encountering some structure which runs across its path, and which is likely to deflect it from its original course. Thus a tear which starts along the central tendon of the perineum may be turned at nearly right angles by the fibers of the triangular ligament or the transversus perinei muscle, or it may pass irregularly through these tissues and leave the wound edges in a ragged and distorted condition. In like manner, the deeper injuries may separate the fibers of the levator ani, or may tear them partly or completely across.

In the superficial and straight variety of wounds coaptation is easy, and repair may be accomplished during the third stage, utilizing the anesthesia which has been employed for the delivery of the child. Bearing in mind the possibility of hour-glass contraction, an exception should be made to this practice when pituitrin has been used in the second stage. Under its action the placenta is frequently sufficiently separated to permit its immediate delivery, and it is expressed at once.

Deeper injuries require a more thorough examination and it is better, under all conditions, to wait for the expulsion of the placenta, and the control of bleeding before deciding what course to take with them. The investigation is much aided by placing the patient in the lithotomy position on a kitchen table, which article of furniture should be made ready for emergencies in all cases of home obstetrics. The field is thus made more accessible and it is often possible to get a better light than in the bed. Exposure is improved by placing in the upper part of the vagina a pack of dry gauze to take up the discharge. A strip of several thicknesses, about 2 yards long and 4 inches wide, is used. To the outer end of this, a tape may be attached, which serves as a useful reminder, at the conclusion of the operation, that the pack is still there. In addition to this the administration of pituitrin at this time is an aid in limiting bleeding. For retraction a guy-rope of silk may be placed at the vulvovaginal edge of the wound on each side. These traction strings are made sufficiently long so that they may be held by unskilled and unscrubbed assistants, if necessary, without bringing them dangerously near to the field of operation. With the wound thus kept dry and open, one may, at least, make a satisfactory examination. One prime essential is to *see* the full extent of the injury and not simply to appreciate it by the sense of touch. It is necessary to identify the structures injured, in order that they may be restored *secundum artem*, and when this can be done, as is the case in a straight wound, although it be deep and extensive, immediate repair, with good result is possible. But if the wound be crooked or ragged as well as deep, and the tissues difficult of recognition, it is usually better to wait till a later time.

The most serious of all parturient injuries, because of their far-reaching pathological results, and the most difficult of all to repair, both because of their irregular character, and their inaccessibility, are those which separate the levator from its bony attachment. These lacerations require the best conditions of light, assistance, and equipment that can be provided, which conditions are often not obtainable at the end of labor. Such cases are better removed to a hospital for later operation. But the lower levator injuries which partly or completely divide the muscle from its attachment to the rectum, are easier to reach, and when other conditions are favorable, respond kindly to immediate repair.

In complete laceration, my preference, although it does not meet with the approval of many others, is to repair at once, whenever possible. I believe that every hour that passes over a divided sphincter decreases the probability of firm union when operation is done, both on account of the retraction and redistribution of the muscle fibers in the sphincter ends, and because of the certainty of infection if the wound be left long in communication with the lumen of the bowel. I have several times closed the bowel and sphincter wounds, and left the remaining injury to be repaired on the next day. If complete tears are left open, a plug of gauze should be placed in rectum for protection until the operation can be done.

One form of injury that is particularly adaptable to immediate repair is that caused by median perineotomy. Following the lead of Dr. Pomeroy, I am employing this treatment in nearly all primiparæ, and in some multiparæ, where cicatricial deposits in the perineum make laceration seem inevitable.

The operation consists of a discission of the perineum along its median line down to the sphincter ani. The cut is made with a scissors when the head is beginning to bulge this body. The relief of pressure at the outlet of the vagina seems to relieve pressure higher up upon the pelvic floor, and I believe that this simple maneuver has prevented more deep lacerations for me than any other measure that I have ever employed. The injury rarely goes beyond that made by the scissors, and consequently there remains an easily accessible wound which is clean and straight, because it is incised and not lacerated. Such a wound I always suture immediately, and in many cases the result is a perineum which is almost virgin in its appearance.

I feel that all injuries, of whatever sort, should be repaired within twenty-four hours of their occurrence if conditions permit. The older teaching was that the wound surfaces might be revivified at any time within a week, by rubbing them with a piece of gauze, but I believe that if several days have intervened, such treatment is not at all satisfactory. The minute vessels which have been torn across, have retracted from the surface, and their mouths are stopped with clots; granulation is rapid by reason of the vascularity of the part; the muscles have begun to pull away from their normal position, and unless some further dissection be done, there will be many buried cicatrices which predispose to imperfect union and an infirm pelvic floor. An attempt at deep or extensive dissection within a few days following delivery, may be much interfered with, or even entirely defeated by the severe hemorrhage which it frequently sets up from the still dilated and engorged pelvic vessels, and it would seem wiser to operate at a time when such dissection is unnecessary.

Furthermore, the time to repair a wound which is exposed to infection is when it happens, or as soon after as possible.

166 CLINTON STREET.

METHODS OF TREATMENT OF PLACENTA PREVIA.*

BY

RALPH M. BEACH, M. D.,

Brooklyn, New York.

WHEN one approaches the subject of the management of placenta previa, he is immediately confronted by a most marked diversity of opinion as to the mode of procedure to be instituted. This must needs be true, if we but consider the variations in the type of placenta previa, the question of primiparity or multiparity, the term of pregnancy, the condition of the mother and baby, and also the relative value of the baby as determined by the number of live children already in the family. In addition we must consider the local conditions, such as the size and softness of the cervix, the presence or absence of labor pains, the condition of the membranes and the amount of bleeding. When we add to the above complex picture of the case, the diverse modes of procedure which may be instituted; when we consider the entire gamut from simple rupture of the membranes to abdominal Cesarean section, is it any wonder that the general practitioner has no clear conception of placenta previa? There is no more complex subject in obstetrics to-day, and even the obstetric specialist himself is often taxed to his utmost to choose the procedure which will insure the mother's life and at the same time give the baby a square deal.

A glance at the maternal and fetal statistics for this condition is sufficient to prove to us that the prognosis for both parties is most serious, especially if the treatment is not adapted to the individual case.

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* Read before a Meeting of the New York Obstetrical Society, April 10, 1917.

The maternal mortality is given variously from 4 per cent. by DeLee to 11.4 per cent. by Harrar, and even up to 18 per cent. by the older accouchment forcè method. DeLee gives the average maternal mortality as 7.7 per cent. in 2153 cases, while McDonald in an analysis of 8625 cases gives it as 7.22 per cent. The average fetal mortalities are given as 61 and 55 per cent. respectively by these two authors.

Given, then, a case upon which the diagnosis of placenta previa has been made, what shall be the routine? There can be but one safe and sane method and that is to empty the uterus by the procedure which will preserve the mother's life and the integrity of her pelvic structures and at the same time give the baby the best possible chance. The only exception to this rule of emptying the uterus immediately is the woman whose baby is nearly viable, who has bled only slightly and who will place herself in a hospital under the constant supervision of trained nurses and attendants. We may temporize under these circumstances, but if repeated hemorrhages occur, the indication is to terminate the pregnancy.

The principles of treatment involved are four in number, namely: to check the hemorrhage, to procure labor pains and dilatation of the cervix, to prevent infection and lastly to combat the shock and anemia. According to DeLee, the causes of death from placenta previa are, in the order of their frequency, hemorrhage, sepsis, rupture of the uterus and air embolism.

Placenta previa is essentially an abnormality demanding hospital treatment and immediately upon admission of the patient, we must make a thorough examination to determine the conditions present. We first note the presence or absence of bleeding and make inquiries as to *how much blood she has already lost.* This is an important point and one which is often overlooked. Unless the operator knows the blood pressure, hemoglobin and red cell count of his patient, he does not know the reserve supply of her vitality and success or failure must depend upon the proper or improper choice of procedure. Blood lost acutely will show itself in the rapid pulse rate, but repeated losses extending over some days may not accelerate the pulse much and yet another sudden loss may turn the tide.

The term of pregnancy and condition of the baby having been determined, the primary vaginal examination is not made until the patient has been shaved and cleansed, is up in the stirrups and we are in a position to do something, if it should be necessary.

What methods have we then at our disposal in the management of placenta previa?

I. Leave the Case Alone.—I am becoming more and more impressed with the number of marginal cases where, with only slight bleeding, labor progresses to a successful termination.

II. Simple Rupture of the Membranes.—This is the simplest method of treatment but is only applicable to the marginal and lateral implantations of the placenta with either a vertex or breech presentation. If the bleeding is slight and the presenting part comes down on the placenta, the condition may be controlled. With the membranes ruptured the *placenta is allowed to retract with the uterus*, so to speak. It must be remembered, however, that this method is most efficacious when uterine contractions are present, and in the absence of these may be of no avail whatever. After the membranes are ruptured a tight abdominal binder may be applied, strychnia and quinine given and even small doses of pituitrin.

III. Tamponade.—There is probably no one mode of treatment of placenta previa upon which authorities differ so much as that of the use of the tamponade. Many authors use it almost exclusively while others have discarded it completely. The author of this paper can see only three possible indications for the use of the tampon:

First.—To control the bleeding during transport of the patient to the hospital.

Second.—Bleeding in the presence of a rigid cervix, in order to procure some dilatation.

Third.—A tamponade by the interne in the presence of alarming hemorrhage while waiting for his attending.

As a routine treatment of placenta previa the tampon has no place and the reasons for this are several. In the first place it will only control active bleeding for a short time and then only if the presenting part, especially the head, is in or very near the pelvic brim.

Again, the danger of sepsis is great, especially if the external genitals have not been shaved and thoroughly cleansed. The case that is tamponed at home by the family doctor is especially in danger as the conditions there are seldom perfect, and the author does not believe in the routine packing of these cases for transport unless the hemorrhage is marked. Freud has shown that of the tamponed cases in his clinic 66 per cent. had fever in the puerperium. Winter reported fever in 80 per cent. of his tamponed cases and Sellheim 60 per cent. with morbidity. The Dresden Clinic reported 58 per cent. morbidity in 276 cases, and also stated that of six fatal cases dying of sepsis five had been tamponed. Again the tampon in many cases will not set up labor pains and the cases are often repacked several times. The average cervix in a case of placenta previa can with safety be dilated manually to a two-finger dilatation, and this is enough for a bag introduction or a Braxton-Hicks version.

IV. Braxton-Hicks or Bipolar Version.—This is one of the oldest and for the mother probably the safest mode of procedure, its only drawback being the high fetal mortality. A few points of technic are important. The operation may be done in any cases where the cervix is dilated or dilatable to two fingers and there is no spastic condition of the uterus contraindicating its use. The internal hand is passed into the vagina and two fingers held passively within the uterus. Under good anesthesia, with abdominal and uterine relaxation, the *external hand does all of the real work of the version*, displacing the head and then pushing down the breech so that the foot may be caught by the fingers within the uterus. The point of technic that I am trying to bring out, is that the internal hand *can cause severe cervical laceration* if the attempt is made to do the version mainly from below. As soon as the foot is grasped it is drawn gently down until the half breech sits upon the placenta and the knee is at the vulva.

The most important thing in treating any case of placenta previa is to save for the woman all of the blood that we can, and the Braxton-Hicks version certainly does this. Schweitzer, in Zweifel's Clinic, found that the average amount of blood lost in the Braxton-Hicks cases was only 335 c.c. as compared to 680 c.c. in the bag cases. Therefore, Braxton-Hicks should be the method par excellence in the exsanguinated mother, where her life depends on every ounce of blood that can be saved. It has the added advantage over the bag method, of necessitating but one manipulation, the patient having time to react from her shock and hemorrhage before she delivers herself, and these cases should without any exception be *left for a spontaneous labor*. The only case of placenta previa I ever lost was one in which, after eighteen hours of labor following Braxton-Hicks and apparently full dilatation of the cervix, I allowed my interne to extract, tearing the cervix and causing sepsis.

The advantages of the bilpolar version are, therefore, as follows: it is sure in its result if done correctly; it introduces no foreign body to cause infection; it requires but one manipulation and one anesthetic. It is without doubt the best method for use in a private dwelling. Its only disadvantage is an increased fetal mortality as compared to the bag method. Doederlein places the fetal mortality 75.7 per cent. and Nägel at 68 per cent. It will thus be seen that it is applicable in all cases before the seventh month where we can get the necessary dilatation and from the seventh to the ninth month if the baby is dying or dead.

V. The Metreurynter.—Just as the bipolar version marked an improvement in the maternal statistics so has the use of the water bag meant a betterment in the fetal results. These bags may be used by either the intraovular or extraovular method and both have their own adherents. The intraovular bag necessitates the rupture of the membranes or puncture of the centralis placenta and introduction of the bag within the amniotic sac. The extraovular bag is placed below the membranes or the centralis placenta and acts as a dilating wedge to open up the cervix. The unfavorable feature of the bag method is that when the bag is introduced the work is only half done. When it is expelled through the cervix, and one must train himself to recognize this time, the accoucheur must be prepared to act, as there may be alarming hemorrhage. This is more true in the extraovular method than in the other. If the presenting part does not come down and control the bleeding, delivery by forceps or version must be done. This means another anesthetic and more blood loss than by the bipolar method but the immediate extraction means more live babies. Opponents of the extraovular method claim that the bag actually separates up more of the placenta and causes more blood to collect above the bag. With the membranes unruptured the placenta cannot retract with the uterine wall.

Doederlein gives the intraovular statistics as follows: maternal mortality 6.5 per cent. and fetal 45.4 per cent. Cragin reports forty-nine cases of extraovular bag with a material mortality of 8.1 per cent. and a fetal of 51 per cent. This would seem to favor the intraovular method.

The bag method then is particularly applicable to the partialis and centralis varieties where the baby is viable and in good condition and the mother is in such shape that she can stand some extra blood loss.

VI. Vaginal Cesarean section for placenta previa was first performed by Bumm but the method to-day has but few exponents. Doederlein has reported a series of forty odd cases with good results while Lindemann reports thirty-one cases with mortalities of 3.2

per cent. and 66 per cent. respectively for mother and child. The writer believes the method indicated between the sixth and seventh month when the cervix is rigid and the baby can be disregarded. After the seventh month the technical difficulties are so great as to almost preclude its use. There is danger of hemorrhage if the placenta is on the anterior uterine wall, and the baby must be delivered immediately, making the danger of cervical lacerations very great. The placenta must be delivered manually causing danger of atony and sepsis and the friable tissue of the cervix must be sutured rapidly. Lindemann reports a 64 per cent. morbidity for the operation.

VII. Abdominal Cesarean section for placenta previa was first recommended by Lawson Tait and we have to-day operators who advise it in all cases where the child is viable and others who cannot see any indication for its use. Cesarean section for placenta previa cannot be looked upon in any other light than a *baby-saving proposition.* When we note the bag method with its fetal mortality of 45 to 50 per cent., and the Braxton-Hicks method with 68 to 75 per cent. fetal deaths, it was but natural that operators should turn to a method which would improve the baby statistics. But are we justified in making a routine procedure and adding maternal risk for the sake of the child? Its routine adoption in all cases is certainly unwarranted and even though it may give better immediate results for both mother and child, its use is not warranted unless we sterilize the patient or do a hysterectomy. The risk of rupture of the Cesarean scar at a subsequent labor, is, in the writer's opinion, the one big argument against the operation. We are still unable to formulate any absolute rules as to which Cesarean scar will, and which will not, rupture when put to the test.

The writer, in October, 1915, reported a series of sixty-four consecutive placenta previas covering a period of seven years, occurring in the obstetric service at the Jewish Hospital, Brooklyn. This series showed a maternal mortality of only 3.1 per cent. and a fetal death rate of 68 per cent. The routine use of section in these cases would most certainly have resulted in a much higher death rate for mothers and a lower one for the babies. But all of these babies could not have been saved, as many were dead on admission. Dorant has shown that only 32 per cent. of placenta previa babies are really at full term.

Granted then, that the operation cannot be made a routine one, how shall we formulate our rules? The classical operation is contraindicated if the patient had been exposed to many examinations by doctors or midwives outside the clinic, or if she had been tamponed or showed a flexible reaction. A poor maternal risk due to marked loss of blood, a dead or nonviable baby, the partial and marginal cases would seem, in general, to be contraindications.

This leaves us as possible indications for the operation the following:

1. The elderly primipara with any type of placenta previa who is having perhaps her only chance for a baby.
2. Any primipara with a central placenta previa.
3. A multipara with a centralis and no other live babies at home.
4. Placenta previa with a contracted pelvis even of the borderline type.
5. Placenta previa with rigid cervix.

But how often do the above conditions exist? Placenta previa is not apt to occur in primiparæ, the cervix is seldom rigid, and then only at a time when the child is still a negligible quantity.

In any of the above cases the mother must be a good operative risk and as we are doing the operation essentially in the interests of the baby the latter must be alive and at or near term.

In conclusion the writer would like to mention several other methods in placenta previa—only to condemn them—namely:

1. Extensive manual dilatation of the cervix.
2. Instrumental dilatation by the Bossi instrument.
3. Tension with immediate extraction.

These methods are dangerous and will bring only disastrous results.

61A Seventh Avenue.

ARE DILATATION, VAGINAL PLASTIC OPERATIONS, OR STEM PESSARIES WORTH WHILE AS AN EXCLUSIVE TREATMENT FOR STERILITY? ILLUSTRATIVE CASES.*

BY

FREDERICK C. HOLDEN, M. D., F. A. C. S.,
Brooklyn, New York.

In these few remarks on the operative treatment of sterility, the writer will confine himself to a consideration of primary sterility, *i.e.*, where the woman has never been pregnant, and secondly, where she has borne a child or has had a miscarriage and remains sterile thereafter. This question has agitated the minds of gynecologists for many years.

Since 1803, when Möller for the first time introduced the stem into operative procedure, the treatment of sterility has passed through the following periods:

The earliest work upon the subject was along the lines of intrauterine, or partially intrauterine and partially vaginal appliances, examples of which are the stems of Möller and Olshausen. The use of these instruments seldom led to a successful result, and many times then, as now, were the cause of infective processes in the body of the uterus, parametrium or adnexa. The reaction following this period, as is usual in medical thought, was extreme, and the treatment of sterility for years was alone a matter of medical therapeutics, and this form of treatment has still its definite place in our armamentarium. Probably because of the frequent failures following such a conservative form of treatment, the operations of Skene, Dudley, Pozzi, and Reynolds were devised.

These operations, especially the Dudley procedure, have had of late a wide application in this class of cases, if we are to judge from the number of postoperative cases it has been our privilege to see. Uterine stems of many designs are in vogue, especially the popular glass stem of Baldwin. This period of operative treatment was followed by what we may call the synthetic period in which there has been a combination of operative surgery with medical therapeutics.

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* Read at a meeting of the New York Obstetrical Society, March 13, 1917.

Recently a great deal of scientific work has been done upon the biochemical or chemicophysiological aspect of this question.

It may be said that we are still in the synthetic period, but I venture to suggest that unless we pause we shall be in danger of inaugurating another period in which operative procedures will increase disproportionately. The writer has but one purpose, that is, to make a plea for a discriminating use of surgery in close association with medical therapeutics.

It is not my purpose to-night to suggest a new or even a more successful means of treating sterility in the female. During the past few months it has been repeatedly and forcefully brought to my attention by operative cases of my own and other workers that we have gone far afield upon this question and that it is high time that we again take an accounting of our position. I report the following cases briefly, as examples of the present over-enthusiastic condition of gynecologists in the practice of operative procedure.

CASE I.—First seen September 14, 1914. Twenty-seven years old, married four years, never pregnant. Menstruation began at fourteen, always has been irregular, lasting five or six days, and always accompanied by pain, which usually began five hours before the flow, and continued for twenty-four hours. Pain has been exaggerated since marriage. Almost constant backache. Very little leucorrhea except for the past two weeks. Frequent urination during menstrual period. Chief complaint dysmenorrhea and sterility. Has had office treatment for the past five months at the hands of two physicians, one of whom twice dilated the cervix in his office. Abdominal examination was negative. Vaginal examination showed a normal nonparous introitus, a small anteflexed uterus with a very short anterior and a long posterior invagination. No adnexal or parametrial masses or thickening were palpable.

On September 24 Dudley-Reynolds operation was done. Postoperative examination on December 2, 1914, showed a perfect operative result. The patient menstruated without pain. However, after three months the pain reappeared, and one year after the original operation a Baldwin glass stem was introduced; this was removed at the end of three months. The patient continued well and menstruated without pain.

The patient was again seen March 5, 1917, giving a history of right-sided pain. The February menstruation was five days late, in March the period occurred ten days early with excessive bleeding. Vaginal examination revealed a soft fluctuating tumor in the right fornix. Abdominal operation on March 6, 1917, exposed a thin-walled ovarian cyst 10 × 6 centimeters, both tubes were clubbed and adherent; the appendix acutely inflamed. A right salpingo-oophorectomy, left salpingectomy, appendectomy and ventral suspension was done.

CASE II.—Aged thirty, married ten years. Menstruated at twelve, twenty-eight day type, five-day habit, no pain. One normal labor, one year after marriage, which was followed by a normal puerperium. This patient was first seen by me January 5, 1916, complaining of sterility. Examination revealed a relaxed pelvic floor. The cervix was in good condition, pointing forward under the symphysis with a long posterior and a short anterior invagination. The fundus was small, retrodisplaced and movable. No adnexal or parametrial pathology was palpable. Operated on February 6, 1916, Reynolds operation to lengthen the anterior invagination of the cervix. Upon opening the abdomen numerous cobweb adhesions were found upon the posterior surface of the broad ligaments and the uterus, the right tube was clubbed and contained pus and the right ovary was adherent. The left tube and ovary were adherent with a patent fimbria, the adhesions were freed. A right salpingo-oophorectomy was done and the round ligaments plicated over the fundus of the uterus, the appendix was removed. The convalescence was normal. This patient was reoperated on at Paterson, New Jersey, February, 1917, for ruptured left ectopic pregnancy.

Comment.—In neither one of the foregoing cases was it possible to palpate the intraabdominal lesions, and there were no symptoms produced by these pathologic states.

These cases were not operated on without study and consideration as to the indication or treatment. I am sure all of you have occasionally seen cases well worked up by competent men before operation in which vaginal operations for sterility, perhaps merely a dilatation, or Dudley discision has been done and then upon opening the abdomen the obvious cause of sterility was found, perhaps a small bilateral hydrosalpinx, impossible of previous diagnosis.

Unfortunately all of us are not able to palpate at all times normal tubes, ovaries, varicose veins of the broad ligaments, and minor degrees of adnexal and parametrial pathology.

Novak following his laboratory work upon the ovary calls our attention to the fact that many cases of sterility are caused by histologic alterations in the ovary. Findley has dwelt at length upon the biochemical factor as a cause of sterility. Polak in his observation from 798 case histories states: "A large proportion of woman applying for relief from sterility have no possible chance of pregnancy due to anatomical change already well established." In view of these facts it does not seem to me to be out of place to suggest that we bear in mind that by far the larger number of the cases applying for relief from sterility are suffering from some anatomical change, which it is impossible for us to relieve, at least by any of the common operative procedures for sterility.

We must realize more fully that the outlook in most of these cases, probably more than 75 per cent., is absolutely hopeless, and that operative procedure of any kind, especially those limited to the vagina, cannot make for success. What are the patient's rights in the matter, and are we justified in offering operative procedures which may add to rather than subtract from the pathology?

It is well known that dilatation and curettage, the stem and the Dudley operation have produced pathology and inflammatory symptoms which were not noticed before their use and that dyspareunia has been a sequel of the Reynolds operation.

CONCLUSIONS.

1. That the cases must be individualized and both contracting parties carefully studied before any treatment is instituted.
2. That many cases are cured by non-operative treatment.
3. That vaginal operation alone very often complicates rather than cures.
4. It seems to the writer, that the mood of what I have called this synthetic period, was in line with a safer and more scientific solution of our problem. We had done well to let the pendulum abide at the happy medium, rather than permit our procedure to follow indiscriminately upon our enthusiasm for surgery. Neither surgery nor medicine may arrogate to itself the treatment of sterility. Until it is definitely determined what is the primary cause of the trouble, no corrective measure should be exclusively employed. Safety and success follow only upon accurate diagnosis, clear cut appreciation of every anatomical and physiological fact, and discovery of every last latent lesion. In short to attempt operation without the data which may be furnished by the internist, biochemist and intraabdominal exploration, is to court failure in the vaginal operation, and increase distress for the patient.

198 Lincoln Place.

ADENOMYOMA OF THE OVARY.*

BY

M. RABINOVITZ, M. D., F. A. C. S.,

Adjunct Gynecologist Beth Israel Hospital, Gynecologist Sydenham Hospital, New York City.

(With five illustrations.)

In my studies of the "Pathogenesis of Adenomyosalpingitis"(1) I have arrived at the conclusion that the glandular proliferations which take place in the Fallopian tubes are in the majority of cases due to inflammatory causes. I have now the opportunity of reporting a similar morphological occurrence in the ovary, which is in my opinion, also the result of an infection.

Report of the Case.—Bertha L., aged fifty-one, began to menstruate at seventeen, irregular in type, every five, six, to eight weeks, scanty in amount and painless. One year ago her menses ceased altogether, but three weeks ago she stained for several days. She married twenty-three years ago, has borne no children, but has miscarried once in the third month of gestation, three years after her marriage.

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* Read before the Section on Obstretrics and Gynecology, New York Academy of Medicine, March 27, 1917.

Previous Illnesses.—Following her miscarriage, she was curetted, and this resulted in a pelvic inflammation which confined her to bed for three weeks.

Present Illness.—About five months ago she was suddenly taken ill with severe abdominal cramps, which were felt most acutely in the right side of her abdomen. After some hours of suffering the pains have subsided, and since then she claims her abdomen is progressively growing larger, accompanied by epigastric discomfort after meals, by frequent micturition, and a sensation of tightness. She has lost no weight.

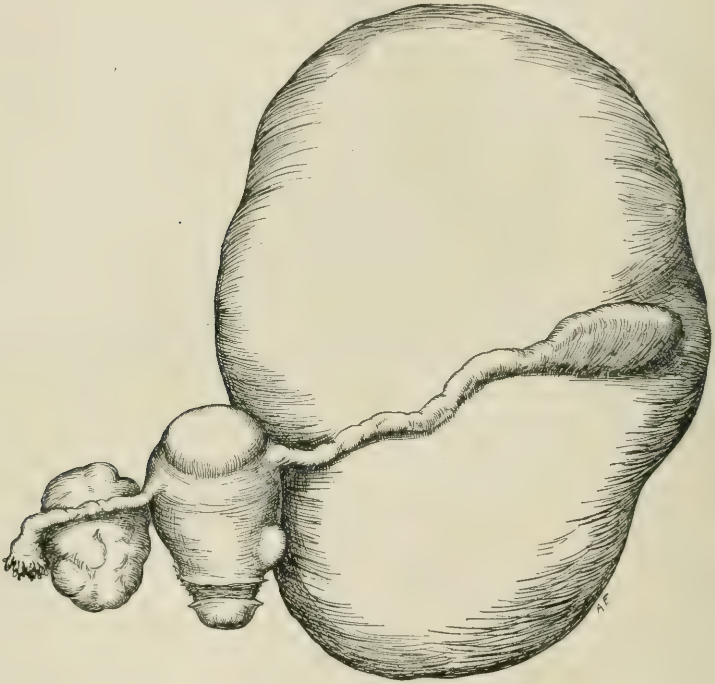

FIG. 1.—Adenomyoma of ovary.

Physical Examination.—The patient presents a well-nourished individual, of good complexion, and healthy appearance. Her heart and lungs are negative, there is no edema of the lower extremities.

Abdomen.—The abdomen is markedly enlarged, the skin is tense, the umbilicus is flattened out. Percussion elicits flatness all over, excepting low down in the flanks, where it changes to tympany.

The percussion note does not vary with alterations in the position of the body. Palpation reveals the presence of a large, smooth, uniform cystic tumor, which occupies the entire abdomen, its upper limit seems to be above the level of the ensiform cartilage.

Vaginal Examination.—The outlet is nulliparous in character, there is no urethral discharge. The cervix is small, the uterine body is about normal in size, irregular in outline on account of two small fibroids. The right fornix is occupied by a doughy tumor the size of a lemon, which is fixed in position, being adherent to the pelvic floor and to the side of the uterus. The left fornix is filled with part of the base of the cystic tumor which fills the abdomen.

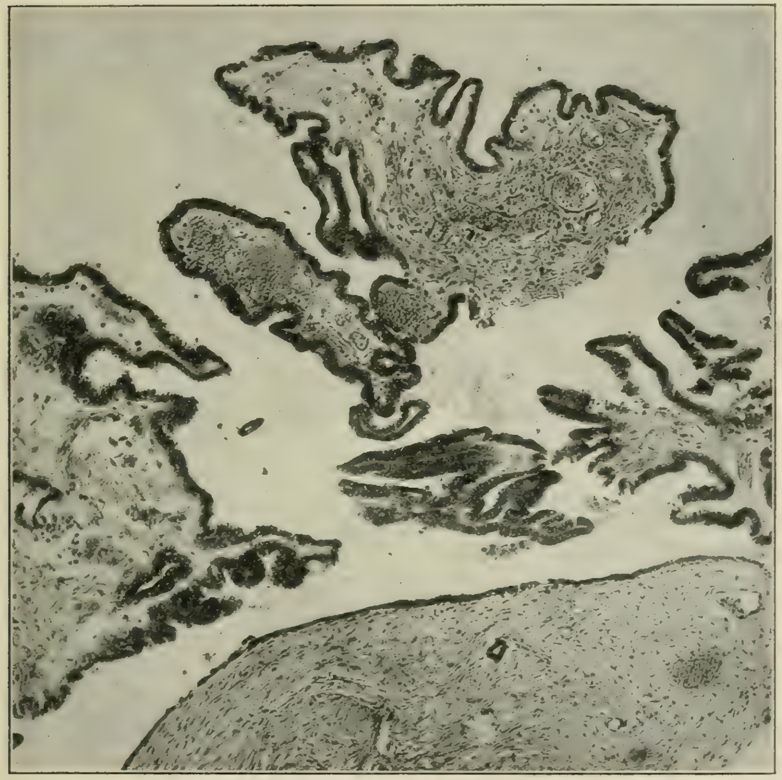

FIG. 2.—Papillary adenoma in the interior of the left ovarian cyst.

Operation.—On October 23, 1916, I performed an abdominal panhysterectomy. The operative findings were as follows. The large tumor proved to be an enormous cyst (Fig. 1) of the left ovary, extending upward to the under surface of the diaphragm. It contained fifteen pints of dark serosanguinous fluid. The uterus about normal in size was the seat of two fibroids, subserous and interstitial in type, one being large as as a walnut, the other about the size of a hazelnut. The right ovary was converted into a semisolid tumor, measuring 4½ × 3¼ × 2 inches, intimately adherent to the pelvic floor, and to the right lateral wall of the uterus. The left Fallopian tube was elongated and thickened to the diameter of the little finger, it was stretched across to antero-inferior surface of the cyst wall, its fimbriated end occluded, terminating into a cystic club-shaped dilatation. The right Fallopian tube was also elongated, thickened, tortuous, bent upon itself and adherent to the posterior surface of the ovary.

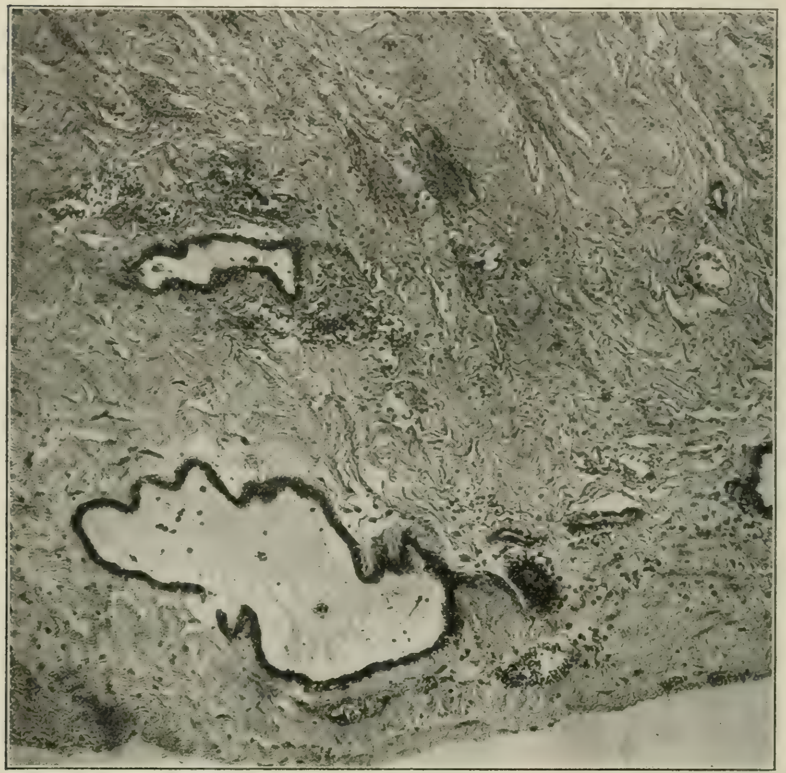

Fig. 3.—Cross-section of the cord-like structure in the cyst cavity showing adenomyomatous structure.

Pathological Report.—*The large cyst* is a cystoma serosum simplex partum papillare. The papillary growths are situated on the inner surface of the inferior wall (Fig. 2). Running across the interior of the cyst cavity in its lower portion, is a smooth cord-like structure, cross-section of which present the characteristic formations of adenomyoma (Fig. 3). The gland spaces are irregular cavities, lined with cylindrical epithelium. Some of the spaces contain mucin and polynuclear cells, surrounded by muscular tissue, which is undergoing hyaline degeneration. *The fibroids* in the uterus also show adenomatous changes (Fig. 4). The gland lumina are lined with a low columnar epithelium, no cilia are to be noted anywhere. In some parts of the section a marked round cell infiltration is present, immediately beneath the epithelial lining. *The right ovary* is semisolid in consistency, neither macroscopically nor microscopically are there any cystic dilatations to be noted. Sections taken from several different parts of the tumor presented an adenomyomatous proliferation (Fig. 5). The areas in the ovary containing these glandular formations have a muscular stroma, which stands out in marked contrast to the connective-tissue stroma of the ovary. The lumina of these glands contain old blood and detritus. The ovarian stroma proper shows everywhere evidences of a chronic oophoritis. Both Fallopian tubes present the classical morphological changes of chronic suppurative salpingitis, and require no further comment.

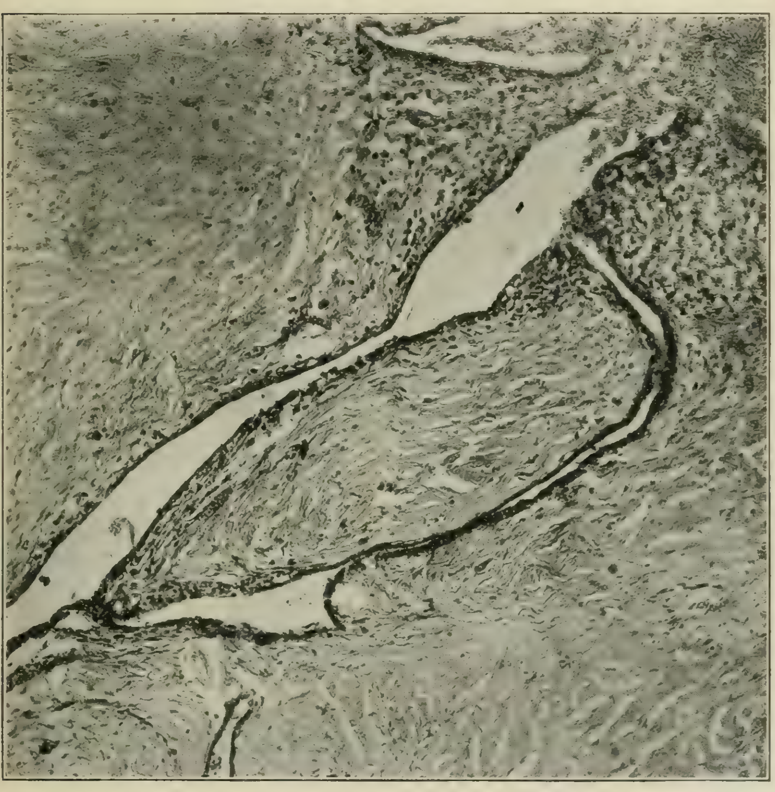

FIG. 4.—Section from fibroid showing adenomyomatous changes and marked round cell infiltration.

Epicrisis.—Analysing the clinical data in this case, we note that this patient has entered the period of puberty at a later date than is customary for women of her race, that the amount was always scanty and the periodicity irregular. These factors point to a genital system that is below par. Her relative sterility for the first three years after her marriage, followed by a spontaneous abortion in the third month of gestation, are strong probabilities of a gonorrheal infection. The pelvic peritonitis which has set in after the curettage following the miscarriage has aggravated the primary infection, terminating in a functional and organic disturbance of her gonadal apparatus with the result of a permanent sterility.

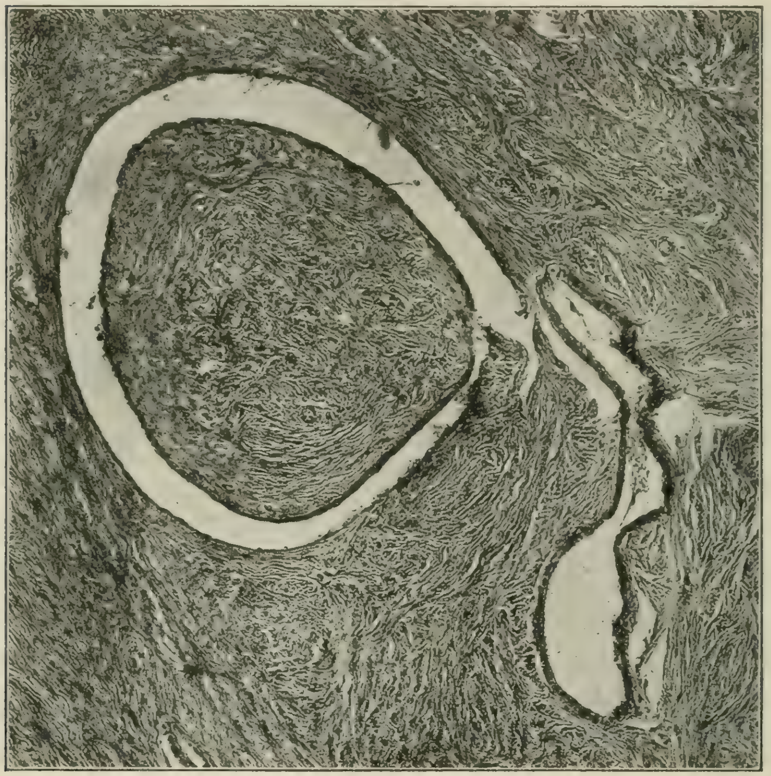

FIG. 5.—Section from right ovary presenting the adenomatous formations. Note the difference between the normal ovarian stroma and the cytogenous muscular structure immediately surrounding the gland spaces.

The pathological findings are characteristic of a slow and insiduous destructive process, so typical of the Neisserian organism. In the left ovary it produced a large cyst, the result of progressive confluence of infected Graffian follicles, which have undergone dilatation. The rapid increase in the size of this huge ovarian cyst, during the past few months, was in all probability due to repeated intracystic hemorrhages. Clinically, these assertions are borne out by the history of a sudden onset of acute pains, followed by a progressive increase in the size of the abdomen, and by the serosanguinous contents of the cyst.

The multiplicity of pathological lesions produced by apparently the same cause, gives rise to several queries, chief among which are the following: Why have the Fallopian tubes failed to present adenomyomatous changes, as they do in other long-standing chronic types of infection? Why has the right ovary responded differently from the left, undergoing a rather unique morphological change? From where has the muscle tissue in the right ovary arisen, in order to form an adenomyomatous structure?

Judging by analogy from our studies of adenomyosalpingitis we may state with a fair degree of assurance, that the tubes have probably been affected much later than the ovary, for the time factor plays an important rôle in the formation of adenomatous changes. As to the source of muscle tissue in the right ovary we may advance three theories. One is that of von Recklinghausen, who ascribes all adenomatous changes to congenital displacements, and in the case of the ovary it may arise from rests of the Wolffian ducts. The second theory, to which I am more inclined, is that of Chiary, namely the inflammatory cause, and in this case we have sufficient clinical facts to justify this assumption. The right ovary was intimately adherent to the uterine wall making it appear as if it were part of the uterine body, these intimate adhesions were the result of previous inflammatory processes, and some of the uterine muscle fibers might have been carried along, forming "ausstülpungen," which have been repeatedly observed in the Fallopian tubes; or the muscle tissue may have arisen from the hilus of the ovary where the peritoneal reflection takes place. The third theory, or rather fact, is, that the muscle fibers which have given rise to the formation of the ovarian adenomyoma, were derived from the ovarian stroma proper, for the ovary does contain, contrary to the accepted teachings, smooth muscle fibers. This anatomical fact has been overlooked hitherto by most teachers of histology, this error ought to be corrected, and the hypotheses that are invoked in order to explain this pathological occurrence in the ovary, will then become superfluous.

As to rarity of the lesion in the right ovary I may state that I have failed to find a similar record. Pfannenstiel(2) states that fibroadenomatous formations in the walls of ovarian cysts, or in the solid portions of multilocular cysts are met with occasionally, but solid adenomas in ovaries which show no cavity formations either macro- or microscopically is a very rare pathological occurrence. Pfannenstiel has met this condition in less than 3 per cent. of all epithelial tumors of the ovary. Stratz(3) gives the frequency of solid fibroadenomas of the ovary as 3 per cent. Pick(4) in his extensive pathological experience has observed ovarian fibroadenoma only four times, and has termed this structure "adenoma endometrioides" on account of its close resemblance to the uterine endometrium. In fact some of the gland spaces in my sections contain blood and detritus. All of the quoted authorities speak of ovarian fibroadenomas, which in itself is sufficiently rare, and not of ovarian adenomyomas, which is unique indeed. In view of these facts I have deemed the report of this case as worthy.

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1261 MADISON AVE.

SOME CAUSES OF FETAL DEATH.*

BY

WILLIAM PFEIFFER, M. D.,

Instructor in Obstetrics, Long Island College Hospital: Obstetrician to the Bushwick Hospital; Assistant Gynecological Surgeon, Kings County Hospital, and Hospital of The Holy Family.

Brooklyn, New York.

LITTLE argument need be offered to defend the proposition that the larger percentage of children stillborn or succumbing during the first two weeks of postnatal life perish from causes arising ante- or intrapartum. Thus in the clinics of Williams and Cragin, 7 per cent. of the deliveries in each of a series of 10,000 cases resulted in death during the period mentioned, and 75 per cent. of these occurred in the first week. The causes assigned were prematurity (50 per cent.), either primary or coincident with other causes; syphilis; unknown or undetermined; dystocia; toxemia; deformity; inanition; placenta previa; ablatio placentæ; others scattering, but these the principal ones in about the order named.

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* Read before a Meeting of the Brooklyn Gynecological Society, March 2, 1917.

Time does not permit a discussion of them all nor of others equally interesting, some of which will yield, at least in part, to prenatal care, while others will be found less prominent as factors later on, as better education in things obstetrical is more general.

Slemons believes that a very fair proportion of the unknown or undetermined causes of fetal death will be shown by bacteriological as well as histological examination of the placenta, and bacteriological examination of all infant scoming to autopsy, to be due to infection. He finds frequently in all cases that there is a placental bacteremia leading, in fatal cases, to infection of the fetus by way of the umbilical vessels, and that these cases would have been overlooked but for the routine double examination of the placenta. The origin of these infections is interesting. De Lee cites three cases, in one of which the streptococcus viridans was recovered from the fetal heart, liver and spinal cord with the only source of infection a maternal pharyngitis followed promptly by an observed cessation of life; the second (less clear) yielded a nonhemolyzing streptococcus without recent evident maternal infection but a prolonged septicemia following a previous spontaneous premature labor; and a third, which returned a hemolytic pneumococcus from liver, heart's blood, brain and cord, with the mother a nephritic and the placenta showing nephritic infarcts. He does not record the bacteriological examination of the placenta and leaves us to infer these were of hematogenous origin from distant foci of infection. Slemons, while admitting this method to have been shown by animal experimentation, as well as that avenue through the tubes, from the appendix, etc., contends that the main channel of infection of the amniotic fluid is by way of the vagina and cervix; his examination of placentæ showed a predominance of bacteria in the subamniotic tissue in the neighborhood of the fetal vessels and not in nor on the villi, as would have been the case had the infection been of hematogenous origin. Ruptured membranes, prolonged labor, and repeated examinations furnish the predisposing and exciting causes of placental bacteremia.

There is evidence, however, of maternal infections in typhoid, pneumonia, tuberculosis and cholera carried to the fetus, but until these are actually observed in the fetal organs the case is uncertain; but if 8 per cent. of all hens' eggs are infected, and supposedly by the infection of the ovaries through the portal circulation, why not a similar infection of the human egg with babies delivered not sterile, as heretofore supposed, but really bacteriological museums?

May it not be worthy of study to take cultures from nose and throat of all new-borns, with complete examination of all those coming to autopsy to determine the extent of bacterial invasion?

A correlated cause of fetal death, though this, too, is obscure, is the intrapartum maternal fever, in which 70 per cent. of positive blood cultures were obtained, setting aside the long-held idea that the temperature was one of exhaustion, and showing definitely that it was due to infection. Further, all women showing intrapartum temperature whether blood cultures were positive or negative had placental bacteremia. If the maternal bacteremia persisted the day after delivery, postpartum infection usually manifested itself, but this persistence was the exception. For the infant the intrapartum fever is more serious and the mortality either before or after delivery is considerably increased varying from 18 per cent. to 61 per cent., according to the observer. These figures are not of absolute value as many of these women with fever had the complications of placenta previa, toxemia, pelvic contraction, or malpresentation as added factors and to what extent these latter were the active causes of fetal death could be ascertained only by placental and fetal bacteriological examination.

Not all infants perish in the presence of placental bacteremia but if we accept the figures for premature rupture of the membranes as occurring in 10 per cent. to 15 per cent. of all cases; and of intrapartum fever as 3 per cent., then we will find placental bacteremia occurring in every fourth or fifth case of early rupture of membranes with grave danger of fetal death. If too, the time-honored postpartum chill be not physiological, but of microbic origin, and the placenta be found infected in so many cases, what babe is actually sterile on delivery. Surely, some interesting data could be obtained from the routine culture and examination, as above advised, of all new-born children.

We can all recall cases in which a dead or macerated fetus was delivered without maternal syphilis, without accidental hemorrhage, and, in fact, without any assignable cause. In the light of this work by Slemons and De Lee it is probable that a close history would have revealed some previous focal infection, and a complete autopsy with bacteriological examination, the organism responsible.

If we have restricted coitus in the later months of pregnancy that added infection of the vagina be avoided as well as premature labor, we have now another reason for such restriction, since we know that contamination of the ovum may occur in this way as well as by the blood stream or neighboring focal infection.

It is leading us too far afield to discuss the infectious origin of abortions in cows, though it is a fertile topic and may add to our knowledge of the causes in the human female.

It is felt, then, that a very fair proportion of the unknown causes of fetal death will be found due to placental bacteremia.

Next to syphilis and the above mentioned, dystocia is most common as a factor, particularly that due to disproportions, malpresentations, and the use of unsuitable methods of delivery, especially the forceps.

The increasing number of men who are measuring their antepartum cases and answer the call to labor armed with a knowledge of possibilities is a tribute to the insistence on this thing in the better clinics and will eventually remove a percentage of the mismanaged cases; but a greater insistence on outlet measurement is essential, since it is here that the greatest proportion of deformed pelves are found (some type of funnel pelvis found as 44 per cent. of all deformity), with the inlet giving no hint to the existence of the trouble. Plass gives this type as one of the causes of rotation to hollow of sacrum of occiput posterior cases.

Could statistics be collected of cases delivered in private practice it is probable that a larger percentage of deaths would be found due to forceps than to any other one cause, excepting syphilis, prematurity, and undetermined causes. A close analysis of the stillbirth certificates, and of those deaths due to infantile convulsions during the first week would show forceps' origin in not a small number. The indications for that operation can never be made broad enough to include the social engagement, world's series or the theater; conscience, not education, must be invoked here. On the other hand, we have all had the experience of being called to help some tired brother who had "toiled all night and taken nothing" when just a bit more flexion, just a bit better application of the blades with proper traction has accomplished the delivery. Education is the remedy there. We forget that in addition to understanding the proper indications and contraindications for forceps, the instrument is but the mechanical aid to the completion of labor, and its correct use must include a knowledge in each case of the exact steps of the mechanism already accomplished for that particular presentation and position, and what is still to be done.

Few are the men who wait too late for the use of forceps, as witness the cervices torn through the vaginal vault when dilatation was incomplete, but when the cry of the suffering is added to the importunity of the family, it is no wonder that the "wee sma' hours" witness the creation of abundant gynecological material, with traction or incompletely molded or insufficiently descended heads adding to the population of heaven's infant wards.

A word about occiput posterior cases. Until we knew better, we have all, doubtless, hastened the delivery of this position by a complete instrumental rotation and paid the penalty, forgetting or unmindful of the 95 per cent. that rotate spontaneously. Even in our later days we have not had the fortunate experience of Plass who reports the delivery of this position with little time added to the length of labor. The optimism of Baltimore has been tinged by the pessimism of Chicago in occiput posterior cases. May I just urge here, in the few posterior positions that need aid, the wider acquaintance with and use of the Pomeroy method of manual rotation. We are not as skilled as he in its proper indication, but its technic is not difficult, and, properly used, it seldom fails and makes of a difficult and dangerous problem, one much easier of solution, and certainly saves babes and spares mothers damage. This maneuver properly applied would make unnecessary De Lee's advice, "if the occiput shows a tendency to slip back from the anterior quadrant of the pelvis, it may be held there by means of a clamp or volsellum forceps affixed to the baby's scalp, then the forceps may be applied with the usual anterior mechanism."

Of placenta previa as a cause of fetal death it is asserted that it ranks second to accidental hemorrhage. Of the latter, De Lee asks, "Is it the disturbed fetal metabolism or the infection of the fetus which generates the toxins leading to blood dissolution and ablatio placentæ?" As a cause of the latter nephritis ranks high, and in searching the histories of five cases seen in a few weeks, a childhood scarlatinal nephritis lighting up under the influence of pregnancy was the probable point of origin in three of them. In another, the hyperemesis of the early months foreshadowed, as pointed out in a previous paper, the later toxemia which spent itself, not in eclampsia, but in premature separation with death of fetus.

Shall we uphold the writers who believe that under the influence of surgery "obstetrics is becoming a lost art," or shall we further broaden the usual indications for Cesarean section to include breech, with its 10 to 30 per cent. fetal mortality? The border-line cases in primigravidæ might seriously be so considered if seen by a competent observer, or managed by the prophylactic laying of the saw. Does the greater chance of a live child justify the added risk to the mother? No hard and fast rules are applicable here any more than in any other obstetrical problem, but the average case of breech certainly ought not require section, in spite of the opinion advanced recently from Boston. Breech is usually a matter of disproportion; if the disproportion be in favor of the child—well; if against the child, operative delivery must seriously be considered.

The above includes the main causes of fetal death. One other is given below with case history and photograph of the specimen, death being due to multiple twists in the cord.

E. G., aged twenty-three, primigravida, last menstruation September 7, 1915, quickening first noted January 15, 1916, estimated delivery June 14, 1916. First seen by me on February 4, 1916, when the fundus was at the location usually expected at five and one-half months. No fetal heart was obtained at this examination though there ought to have been no difficulty in finding it as patient was not obese; this was disregarded, however, on the strength of the patient's statement that life was felt daily. Beyond occasional frontal and occipital headaches, and constipation nothing notable was found; urine negative throughout pregnancy, and blood pressure never rose over 125, 80.

Office visits on February 23 and March 24 disclosed no irregularities of any sort either referred to by the patient or elicited by questioning. On April 21, patient reported that life had not been felt for about two months, though, as stated above, this was not in accord with her statements on prior visits. The question arose then was she pregnant or was there some other intraabdominal condition with supposed quickening? No positive signs were obtained at any time, as far as the fetus was concerned, but the breasts gave all the usual signs and as this was a primigravida it was believed she was pregnant. Subsequent examinations gave nothing different, but it was noted that the fundus which now (April 26) should have risen to a seven and one-half months position in the abdomen was but at the six months' level. This is not of absolute value, depending on the size of the fetus, amount of fluid, etc., but the importance of it here was, that in over two and a half months the uterus had not increased in size over that seen usually in one-half month. It was believed the fetus was dead but the ordinary signs of that state were indefinite.

On May 21, 1916, patient delivered herself of a badly macerated fetus, 38 cm. in length, and according to Haase's rule between seven and eight lunar, or six and one-half calendar months uterine gestation, agreeing with the size of the uterus, approximately, as found on April 26.

Examination of the cord and placenta showed a rather unusual condition in a countless number of twists of the cord in its long axis, completely shutting off the blood supply resulting in death. The cord measured 37 cm. long and the torsion reduced the caliber in places to that of a fine string, well shown in the photograph.

Schauta records a case in which he counted over 300 twists and believes it to be a postmortem occurrence. Most authors agree with him, but De Lee states "it may be impossible to determine whether the death of the fetus resulted from stricture of the cord, or whether the torsion of the cord was produced by the active movements of the fetal death agony, or whether the twisting occurred after the child's death. Probably all three occur." It is recognized that the time of its occurrence is impossible to prove but it is believed that in this instance it was an antemortem affair beginning early enough to diminish the blood supply to such an extent as to interfere with the normal growth of the fetus, hence the small size of the fundus for the period of gestation; again a weak undersized fetus had cardiac impulse of insufficient force to be heard easily by abdominal examination. After the growth was checked by insufficient blood supply, further twists completely occluded the umbilical vessels causing death.

368 McDonough Street.

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TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Meeting of March 1, 1917.

The President, Frank C. Hammond, M. D., *in the Chair.*

THE TREATMENT OF PLACENTA PREVIA.

Papers were read by Drs. Tallant,* Boyd,* and Arnold.*

Dr. Richard C. Norris.—There are so many factors involved in the maternal and fetal mortality of placenta previa that I think a study of the problem with the hope of getting light on methods of treatment from statistics, is a waste of time. This is especially true since the maternal mortality depends especially upon the degree of hemorrhage, and sepsis; the infantile, upon hemorrhage and viability. These factors vary so much in individual cases that they destroy the statistical value of the results of any one method of treatment. It is certainly true that the routine or too frequent use of the operation of Cesarean section will increase the mortality of this obstetric emergency at the hands of the general surgeon who undertakes obstetric work, without enlightened obstetric discrimination. It is an easy matter for him with scalpel in hand, by a quick abdominal operation, to rescue immediately the woman under certain conditions and he thinks that section, therefore, is the ideal method of treatment for almost all cases. Cesarean section has its field in placenta previa, but it is a very limited one. This limited field will be truly defined by men of wide experience, not only in Cesarean section, but in the treatment of placenta previa by other methods as well. It is interesting to see the stand which Dr. Boyd has taken, enthusiastic as he is in regard to this operation, for other indications I have changed as he has changed. I have done abdominal, vaginal, and extraperitoneal Cesarean section for placenta previa, and my experience would make me exclude all but abdominal Cesarean section restricted to the conditions that must prevail to make it in my judgment worth while and indicated. Those conditions have been brought out to-night, and I would emphasize that they are rare—a viable child, a good surgical risk on the part of the patient, rigid cervix, uninfected patient, complete or central placenta previa. Clinically we find few cases in which all these conditions are present. A shocked and probably infected patient brought in the ambulance is not a good surgical risk. When we recall that acute gastric dilatation occurs three times as frequently following Cesarean section as after any other abdominal section we must realize that its use in placenta previa accompanied by grave hemorrhage and shock, is much more serious than when selected for pelvic deformity. In one-half of the cases the child has not reached viability; then one-half such sections would be done solely for the mother. That the operation is an emergency operation means, as a rule, that some one has handled the patient. No greater truth about placenta previa has been stated than that by Dr. Arnold, that the first one who sees and attempts first aid to the patient is the one oftentimes who determines whether the woman is to live or die.

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* See original articles pages, 46, 26, 38.

Now, the objection to the tampon in our clinics is that the men outside do not know how to apply it. I have had patients sent in to me with the vagina tamponned with a small strip of gauze which might as well or better have been pushed out the window for all the good it was doing. If we have a case of central or complete placenta previa, rigid birth canal, a good surgical risk in a woman whose general health is good, kidney condition normal, with freedom from toxemia, with the child at term, and good heart beat, I think no obstetrician would be foolish enought to attempt to deliver by any other method than that of abdominal Cesarean section. I would, therefore, express my conviction that the operation is sometimes indicated but very rarely as we find the cases actually in our work.

The diagnosis of the type of placenta previa is often very difficult, and always should help to determine the treatment. I believe that an examination under an anesthetic is usually essential to determine the type. Otherwise, you will not be able to distinguish blood clot from attached placenta. You must, therefore, make an internal examination often with the entire hand in the vagina. Having done this and made a study of the soft parts you will determine what treatment you will follow, having excluded the *necessity* for Cesarean section. Dr. Arnold has spoken enthusiastically of the tampon; the principle is a good one. But if you stop to think, what is it to accomplish in this emergency. A tampon placed within the lower segment of the uterus with its pressure from within outward will be applied much more efficiently than if placed in the vagina with upward pressure against the receding vaginal portion of the cervix. Therefore my rule is to use a bag inside the uterine cavity. The sac of waters must be ruptured; I have in some cases applied in addition to the bag a very large distending vaginal tampon. Such a double tampon offers greater safety than the simple vaginal tampon. After delivery, a firm tampon from fundus to vulva is always indicated.

Regarding the question of accouchment forcé, I did not hear Dr. Tallant's paper, but we all know the dangers in placenta previa of attempting to deliver too rapidly and lacerating the friable lower segment of the uterus. It is absolutely necessary that we should avoid that.

The danger from pituitrin in the early first stage of labor is not, under normal conditions, laceration of the cervix, but is that of separation of the placenta and its ill effect upon the child. You should ascertain the individual susceptibility of the woman to pituitrin before giving full doses of the drug, thus avoiding the violent reactions which will occur in some women. In placenta previa, however, its advantage is that firm and prolonged uterine contraction makes the presenting part an efficient tampon, from within outward. In the treatment of placenta previa, as we find the cases, we must as a principle of treatment often abandon or desert the child whose viability is so often problematical, and we must realize that it is the mother who is to be saved. The saving of the child is an incident in the treatment and not the express purpose. Let the woman have a baby subsequently, but save her this time from the dangers of hemorrhage and sepsis.

Dr. Daniel Longaker.—I feel that an era, not only in obstetrics, but in the treatment of placenta previa, was established more than twenty-five years ago when the classical paper of Hoffmair and Lohmer appeared. The two cardinal features of that paper were prompt interference just as soon as the diagnosis of placenta previa is made and bipolar or combined version after the plan of Braxton-Hicks. As has been well stated by Dr. Arnold, painless hemorrhage in the last three months of gestation makes certain the diagnosis. Then bring down one leg and leave the farther progress of the case to Nature. There is no hemorrhage after the leg is brought down, it acts as a tampon. I think the influence of that tampon has been markedly for good. Any deviation from that plan has resulted disastrously many times within my own personal knowledge. We must disregard the child, otherwise the results will be disastrous for the mother—death from hemorrhage and shock due to laceration. I, therefore, long ago learned to rule out anything like immediate extraction, or the allied treatment of accouchement forcé. I may have been wrong in this but so far as my own results go in perhaps nearly 100 cases, I have seen but two maternal deaths, both resulting from hemorrhage postpartum. These deaths would have been prevented in the better organized plans of treatment now possible in a well-organized maternity. I have had the misfortune of operating on a central placenta previa by the Cesarean operation and of delivering a baby that failed to survive. The mother in that case had been infected, and though she had a stormy time, recovered. I, therefore, think the hope of saving the baby by the method of abdominal Cesarean section is doomed to frequent disappointment, that it is often unwise and that the indications for the operation are so rare that they practically do not occur. The method of procedure is ordinarily easy. The intraovular use of the bag can be done by the interne, as was done in the last case I saw only a few days ago. It is perfectly feasible and is not followed by any considerable hemorrhage. The baby in the case just mentioned was born alive but survived only three hours owing to prematurity. After that there is certain teamwork that can be easily done in a well-ordered hospital, and all should always be in readiness, such as the hot saline douche, the saline infusion and the De Lee gauze pack should there be postpartum oozing.

Dr. Barton Cooke Hirst.—I have had ample experience with all the plans of treating placenta previa in the past twenty-five years. For the last five years I have found myself treating the majority of cases by Cesarean section, I should say in about 90 per cent., and I believe I shall continue to resort to this operation in that proportion in the future. I have been astonished to-night to hear the condemnation of Cesarean section which I consider by far the safest method of treatment of placenta previa in the hands of an expert. In the hands of the general physician it is quite a different matter. There I think the bag, tampon and podalic version ought to have first place, but not in the hands of a specialist. There is no question in my mind but that Cesarean section gives to the mother and the child the best chance of safety. Krönig did sixteen successive Cesarean sections without loss of mother or child, as you remember, and for the last five years I have not lost a case of placenta previa treated by Cesarean section. The occurrence of profuse hemorrhage ought not to deter one. I have seen women brought into the hospital exsanguinated and absolutely pulseless in whom I have resorted to transfusion and then operated with perfect success.

In answer to Dr. Schumann's inquiry, I have never seen a case of central placenta previa diagnosticated before hemorrhage. Central placenta previa usually begins to bleed as soon as the placenta is formed at the third month and the bleeding usually recurs. As soon as I have made such diagnosis after the seventh month I would deliver the woman by Cesarean section, which I believe is the only plan worth considering for central placenta previa. I believe the future tendency will be all in favor of the operative treatment of these cases. Those of us who have resorted to this treatment in a number of cases will show a better mortality for both mother and child than by any other procedure.

Dr. John A. McGlinn.—I am in accord with Dr. Hirst's remarks. We should bear in mind in treating placenta previa that we have two lives to consider and that this object is best attained by abdominal Cesarean section. I am fully convinced that there is a time in every case of placenta previa when abdominal Cesarean section offers the best chance both for mother and child. Instead of speaking of the indications for section and considering the case from that standpoint, we should study the case from the standpoint of contraindications for section. If no contraindications exist, you can do abdominal Cesarean section with a lower mortality for both mother and child than any other obstetrical procedure. Unfortunately, perhaps the majority of cases of placenta previa offer many contraindications to section. The patient who has been bleeding profusely and who is tamponed outside of the hospital is presumably infected and does not present as a rule the type of case suitable for section. The exsanguinated patient, however, who has not been tamponed or who has not been frequently examined, does not necessarily present a contraindication to section. Such a patient will frequently stand section much better than accouchement forcé. The marginal and lateral types of placenta previa with a dilated cervix do not require section. If these cases are seen, however, before dilatation has occurred and before bleeding has been profuse, section offers them the best chance. The central type of placenta previa almost under any circumstance is best treated by section.

Dr. Stricker Coles.—I have never seen a case of marginal or partial placenta previa in which Cesarean section was indicated. I believe that here the operation would increase the mortality to the mother. In central placenta previa with the child viable and in good condition Cesarean section is indicated in the majority of cases. I have seen one case in which I do not believe delivery could have been made by any other method than Cesarean section and both mother and child live. The patient was a primipara, twenty-two years of age, whom I saw one week from the end of a normal gestation. The woman was bleeding profusely, was pulseless and practically dying. She had been bleeding for four days. The placenta was exactly central, the cervix admitted one finger. At the solicitation of the attending physician that something be done, I started transfusion, brought down a foot by Braxton-Hicks method, though I knew it was too late, as the child was dead and mother dying.

The child, weighing 9½ pounds was delivered dead after the death of the mother. It was delivered through the placenta without rupturing the membranes. Rapid delivery is a mistake in central placenta previa. I saw one such case in which the woman died in a few minutes from hemorrhage from rupture of cervix. In central placenta previa if the baby is dead or premature we can deliver safely by the Braxton-Hicks method, or by drawing off amniotic fluid by passing uterine dressing forceps gently through placenta opening the blades, then give ergot preferably or pituitrin and control bleeding by pressure of head. Two cases have been so treated without packing with good results to the mother.

Dr. C. B. Reynolds.—The treatment of placenta previa especially in the hands of the general practitioner resolves itself into the art of performing version, with a minimum of trauma and danger to the mother and child.

I have seen only two cases that I could convince myself were really central implantations of the placenta.

One in a woman pregnant at the fourth month, the symptoms being hemorrhage without pain. On internal examination the placenta could be palpated through the partially dilated os. Packing the vagina resulted in the expulsion of the product of conception intact, with the placenta anterior and adhering to the gauze.

The second patient, pregnant at seven and one-half months had a severe hemorrhage from the vagina. Her physician made a diagnosis of placenta previa, packed the vagina with gauze and sent her to the Philadelphia Hospital. The interne removed the packing in order to examine her and was compelled to immediately repack the vagina on account of the alarming hemorrhage. I removed the pack about one hour later and found the placenta completely encircling the os. My manipulations provoked a fresh hemorrhage and I hastily repacked the vagina and performed a celiohysterotomy, and extracted a live child. The mother reacted promptly and left the hospital in good condition. The indications for Cesarean section in this case were an alarming hemorrhage while attempting to dilate an unyielding cervix, an earnest desire for a live baby which was viable and alive and the mother in a condition to withstand the shock of an abdominal section.

In the marginal type of placenta previa, where bleeding usually occurs when the os is well dilated and at the height of a uterine contraction, the life of the child may be saved by the timely application of the forceps.

Dr. Boyd, closing.—We are all agreed that Cesarean section is sometimes indicated, but we differ in regard to the frequency of its indication. The figures I have given show the lower mortality by the vaginal route than by Cesarean section. I think that only the man who has the obstetric training is best fitted to differentiate between the varieties of placenta previa. Those who favored Cesarean section in placenta previa claimed that hemorrhage is not a highly important factor. I think, however, that hemorrhage does seriously depress the patient and still feel that while the operation has a field of usefulness in placenta previa it is a restricted one.

Dr. Arnold, closing.—I fully realized, of course, that in presenting a paper which had for its chief feature the advocacy of so old fashioned a measure as tamponing for placenta previa, I was laying myself open to all kinds of criticism, and the drubbing I received at the hands of Dr. Foulkrod and others was no more than I expected. Nevertheless I *still* believe that tamponing is the *first* and *most practical* thing to do in a large majority of all cases. Two of the main contentions of my paper have not been denied, namely—that it is the family doctor who first sees most of the cases of placenta previa, and that the ultimate safety of these cases depends very largely upon him, because he is the first to undertake treatment. It seems to me, therefore, that instead of criticizing and blaming him for not being able to treat these cases as they would be treated in a hospital, we would do better to show him how to do safely and effectively the one thing that he *can* and *must* do in the home. Tamponing has been condemned by some of the speakers this evening because it is often so poorly done. But how can we expect anything else, so long as meetings like this, and the medical schools, and leading obstetricians continue to teach that all cases of placenta previa should be treated by Cesarean section, or other methods that can only be practised in the hospitals? At the suggestion of the program committee I kept in mind the general practitioner and his needs, in writing my paper. I tried to set forth in a plain simple manner the type of cases suitable for the different methods of treatment, especially that by tamponing, and the technic by which the latter can be satisfactorily done in the home as well as in the hospital. In the last few years I have used this method, or have seen it used rather frequently, and have yet to see a case of infection, or of serious failure, where the packing was done in the manner described. In my own cases I think I have been able, so far, to save all babies that were alive when they came under my care.

I verily believe that we will accomplish more for the treatment of placenta previa by teaching our students and the profession at large how to do *well*, some of these more conservative methods, than we will by teaching the more refined hospital treatment than can only be carried out by experts.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of March 13, 1917.

The President, JOHN O. POLAK, M. D., *in the Chair.*

DR. FRED'K C. HOLDEN read a paper on

THE FUTILITY OF TREATING STERILITY BY DILATATION, PLASTIC OPERATION OR STEM PESSARY.*

DISCUSSION.

DR. ROBERT L. DICKINSON.—"I suppose there is no important subject that we really know less about. We have not yet tried placing a double-cupped slide under the microscope, putting the semen in one cup and the vaginal secretion of the woman in the other cup and allowing them to come together under the slide and see what happens. We have no method of testing what the acidity of the vagina is. You cannot get a chemist to tell you what the acidity of the vagina is. We have only begun to know anything about semen. Kerry has had *x*-rays taken by using silver preparations in the tubes. My last two cases were as follows: Two patients were *x*-rayed on the same day. In one case we said that the collargol ran out from the tubes into the peritoneum. In the other case we said, 'Our guess is clubbed tubes.' Both cases turned out to be right. One case was operated upon later and found to have adherent tubes. She was operated for appendicitis and her pelvis was looked at. There is great difficulty in getting shadows of the tubes because the sacrum is in the way. There is no part of the body more confusing than the pelvis in trying to get tube shadows, but great progress has been made and men who have studied that particular thing will be able to give us in certain cases some knowledge of the matter.

"Examination of the semen before every operative procedure goes without saying.

"Dr. Polak has classed me as a believer in the stem. I have never seen sepsis or peritonitis, that I know of, from a stem."

The doctor said that he had done some Dudley-Reynolds or Dudley operations, but that the internal os did not remain open as if a Baldwin stem were left in for two or three periods. "Of course," "simple dilatation may keep the cervix dilated. The stem is left in for three months and keeps things correct for six or eight months.

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* For original article see page 64.

That provides additional chances for pregnancy provided the trouble is a blockade. Simple cases are cured by cleaning out the sticky mucus in the cervix and the results are brilliant."

Dr. Asa B. Davis.—"It falls to my lot to see quite a good many of these cases of sterility, and I haven't done abdominal operations. I do not feel that I have exhausted the subject by any means. While I haven't the data at hand, I should say that about 25 per cent. of the cases in which stem pessaries have been used have resulted in pregnancy. I have never seen a case of inflammation following the use of these stems and I do not hesitate to use them. I suppose it may come to us sometime. I can readily see where infection might take place. I am always afraid of it; and so while I haven't seen that occur, a great many pregnancies have resulted. A year ago last December a patient came to me who had been married three and a half years, and the first statement she made was that whatever was done she did not want an operation because she had been curretted three times already. That was in December. I put in a stem and left it in until the second of March (I have the dates in this case in my mind), when the stem was taken out. I did not see her again until the second of May. Her last period had been on the eighteenth of March. She was delivered early this December after a very short labor; that is, the labor started just before 12 o'clock and the child was born by 3 o'clock; and the mother stated that at every menstrual period which the daughter had had before that the pain had exceeded her labor pains."

Dr. Joseph Brettauer.—"I have never used a stem in my life. I have seen a great many inflammatory conditions caused by stems in former years when stems were used that reached pretty nearly to the fundus of the uterus. Stems were used more frequently then than now and I have in mind several cases of acute metritis and peritonitis caused by that treatment, and they have always remained so vivid in my mind that I have never felt as though I wanted to use them, and while I believe all the statements made by competent, reliable men, I still have an antipathy to using them simply because my experience has been such as I have outlined.

"I have also learned to distinctly refrain from advising any operative measure in any woman who has previously undergone prolonged local treatment. It facilitates infection, and the only case in which I am still sorry that I did a Dudley operation was one in which I was ignorant of the previous treatment. She got up a very acute pelvic peritonitis and I nearly lost her. That was nearly fifteen years ago. Since that time I have been very particular about the history of the cases that I see and the previous treatment which they may have had.

"Another point I would like to emphasize is this: our results with so-called conservative surgery on the internal organs, so far as I know and so far as I have been able to ascertain from the literature, have been absolutely unsatisfactory. Once in a while a case here and a case there is reported of opening the tubes and partially resecting the tubes where pregnancy has followed, but the results are so unsatisfactory that I personally feel that I have no right to advise a patient to be opened for an operation which, in my opinion, is always a serious interference on such slim hope, and I have refrained from doing it. Of course, when there are palpable lesions the indications are entirely different; then I do not operate for sterility, but I operate for palpable disease.

"Another point I would like to emphasize is this: in a great many cases of sterility we overlook congenital conditions which will not be influenced by any means at our command."

DR. W. GILL WYLIE.—"Sterility has long been a special study of mine and the simple treatment which I have followed for some forty years has given me very satisfactory results, and it was not by the use of stems at all that these results have been achieved. I do not see the sense of using stems in the treatment of sterility because if your stem doesn't have drainage it doesn't accomplish the results that you are after. However, if a drainage tube is put inside of the stem it is of some value.

"I have always divided sterility into two groups—parous and nulliparous—which must be treated usually by very different means. If you put the uterus in a normal condition it is one step in the right direction. Whether a woman is capable of having a baby or not there is a very simple test which I always apply to all cases, and that is to determine, in the first place, as to whether there are any complications or not.

"The cause of sterility in nulliparous women is an underlying one in four cases out of five—yes in nine out of ten; and that cause is arrested development, especially during the period of the girl changing into the woman. It is at this time that the tissues become weakened and are attacked by septic germs that would not attack normal tissue. As a result of the action of these germs the tissues become weakened and the result is an improper development of the parts. In these cases of sterility with an abnormally small uterus we often find a little eroded spot, which the older doctors called 'ulceration,' but which we call erosions, pushing up the frail tissue so that it is not able to carry out its function. Now, those cases are numerous, especially among educated people, abnormal living people, city-bred people, especially generations of city-bred people. Those people must all be more or less imperfectly developed; and the characteristic thing which I have found is the so-called inversion. That is nothing but the position of any weak organ; and in these cases this is due to the abnormal condition of the cervix uteri. These people do not have anything like a fully developed uterus with normal circulation; and so a great many of them cannot even carry out the simple function of menstruating without something being done toward assisting them or developing it. It, therefore, behooves us to put the patient in good condition.

"The method of procedure which I use in these cases is to put the patient in the Sims position and introduce a sound into the uterus. If this act causes either pain or bleeding the case may be considered as a normal one. If there be no pain or bleeding and there is a little white secretion it is not a proper case for medical treatment, but the patient must be put in good general condition. Let her alone and put one of these in (the doctor exhibited his special small drainage tube), and it might be the means of increasing the circulation and bringing on the development. This has been modified in many ways, but it is a drainage tube absolutely. This will let the blood come out as soon as it starts and it will not collect and become clotted, but will be forced out through the cervix. Invariably this goes and catches in the folds of the cervix, and it cleans as it goes. I have seen these large (French) tubes in cases which have come to my office and which were inserted at hospitals in this city. The trouble with these tubes is the fact that they are liable to cause irritation of the bladder. The operation must be done by a man who has good mechanical sense. If it is done by a man who does not possess good mechanical sense and who does not realize what drainage is and who has not enough dexterity to do it properly, it will result in failure. But this is the tube I pass in and as soon as the blood comes into the uterus it flows out. However, as I say, it must be put in properly. If there is any pain the first time and if the pain disappears you can leave it in a small uterus for two months, but you must use a small cleansing tube twice a week and you will have no bad result. I have been using it for forty years with very satisfactory results.

DR. JOSEPH BRETTAUER presented a specimen of

LYMPHOSARCOMA OF THE CECUM

which he removed from Mrs. R. G. on Feb. 23, 1917. The patient is thirty-three years of age, has had two children; menstrual history normal. She was operated upon for rectocele, cystocele and descensus of the uterus in December, 1915, on the writer's service. Nine days after operation she had a very severe secondary hemorrhage from the line of suture in the anterior vaginal wall, necessitating resuture.

In October, 1916, she was admitted to Dr. Brill's service at Mt. Sinai Hospital, complaining of weakness, shortness of breath and repeated hemorrhages from the rectum.

A small, irregular mass was felt to the right of the uterus, but a thorough examination (proctoscopy and sigmoidoscopy) did not reveal the source of the hemorrhages. Her hemoglobin was 41 per cent., red blood cells, 3,200,000, white cells, 12,500. After two months in the hospital under general tonic treatment, she was discharged at her own request. At that time her hemoglobin had gone up to 57 and the last examinations of stool for blood, on Dec. 13th and 14th, were negative.

When seen by me on Feb. 2, 1917, the patient looked extremely anemic. A large, movable, painless mass was distinctly palpable in the right iliac fossa, but no connection between this mass and the pelvic organs could be demonstrated bimanually.

She was readmitted to the hospital on Feb. 7th, when her hemoglobin was 28, red blood cells, 2,600,000, white cells, 13,100, polynuclears 68 per cent. and leukocytes 32 per cent. During the night of Feb. 10th a severe hemorrhage from the bowel occurred; hemoglobin 16 per cent., 400 c.c. of blood by citrate transfusion raised the hemoglobin to 33 per cent. on Feb. 12th. On Feb. 15th, syringe transfusion (Unger) of 400 c.c. On Feb. 22d, slight hemorrhage from bowel of bright red fluid and dark clotted blood; severe abdominal pain.

The diagnosis was not positively made; malignant neoplasm, originating in the retroperitoneal glands and breaking through into the bowel, or malignant neoplasm of the bowel itself, were the two alternatives.

On Feb. 23d, exploratory incision. The condition was found to be operable and the specimen presented here was easily removed in typical fashion. Intestinal anastomosis was made by means of the Murphy button, this method being selected mainly as a time-saving procedure. Immediately upon closure of the abdominal wound, 350 c.c. of blood were given by citrate transfusion.

With the exception of a superficial infection of the abdominal wound, convalescence was practically uneventful. On March 3d, the patient had a spontaneous, partially formed evacuation. The Murphy button was recovered from the rectum on March 12th. Her condition is very satisfactory; she is sitting up, with wound practically healed. Hemoglobin 35 per cent.

Description of Specimen.—Specimen consists of 8 cm. of terminal ileum, cecum, appendix and ascending colon. The ileum and ascending colon are normal. The colonic wall is rather thin, the ileum somewhat distended. The appendix is also normal. Occupying the site of the cecum is an enormous, nodular, lobular, whitish tumor, which apparently springs from the mucous membrane in the intestine, projecting into the lumen in large lobulated masses, part of which is necrotic, not completely obstructing however. The tumor has penetrated through the entire thickness of the intestinal wall and can be seen on the peritoneal surface as confluent, yellowish white nodules. Extending into the mesentery in direct connection with the main mass of tumor, are numerous nodules of neoplastic nature, varying in size from 1 to 6 cm., the largest one being deeply hemorrhagic in appearance. There is a marked redundancy of mesenteric fat of the cecum and ascending colon. The tumor mass is hard and on section has a whitish, cellular, homogeneous appearance suggestive of sarcoma. The tumor measures 16 × 18 × 12 cm.

DR. JOSEPH B. DE LEE presented a paper on

SEVERAL EVERYDAY OBSTETRIC PROBLEMS.*

DISCUSSION.

DR. RALPH H. POMEROY.—"I have no statement to make except as regards the matter of posterior rotation position cases. I agree entirely in principle with Dr. De Lee's procedure, but I think I am a little further along in the game than he is by several years."

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*For original article see page 15.

Referring to the question of "when to rationally execute our two-stage management of posterior position cases," the doctor said:

"The great problem is to decide when a case is a case that must be saved the subsequent risks of injury from the passage of a child in the persistent posterior position or the maladroitness of the Scanzoni operation in damaging the levators. It requires a great deal to be able to tell when to execute the maneuver, but if Dr. De Lee would grasp the proposition that it is possible to convert the posterior positions, if attacked early enough, into an anterior position that will come down as such and will not require, under any circumstances the maneuver of the tenaculum in order to hold it while he is applying the forceps, I think he will see perhaps that that is a step further in advance. The rest of you are aware of my proposition that we can readily execute a suprapelvic rotation of a posterior position through 180 degrees instead of only 90 degrees so as to get the head to ascend again into an anterior position directly opposite to the posterior position that it originally occupied and that it can be trusted to remain in that posture and position and if the woman has any power left at all, to come down to a point where the application of forceps can be executed.

Dr. Austin Flint, Jr.—"In the five minutes which I presume I shall have, I want to say that it is refreshing and nice to hear a paper on an obstetrical subject where the importance of better obstetrics is emphasized. Obstetrics as it is practised by the ordinary man who calls himself an obstetrician is terrible. It is the most difficult thing to teach internes who are supposed to know what we think are the rudimentary things in obstetrics.

"Dr. De Lee has divided his paper into three parts. The first part is too big a one to discuss. I think that every word of it is true, and the education of obstetricians in ordinary relative cleanliness in applying well-known methods of antisepsis to delivery in so far as the exigencies of the case will permit, is one of the things which we are bound to advance and one of the things that will be productive of the greatest good to the profession.

"The second part of the paper—the correction of malposition, is one of the pressing problems. It is a problem which is very far from being settled, and as long as it remains a problem there will have to be differences of opinion, but I would like to put myself on record as not agreeing with the procedure of correcting posterior occiput early in labor. I believe there are very very many cases of posterior occiput early in labor that are never found and never recognized at all; that the man who attends the obstetric case thinks he has an abnormal case; that it was originally not a posterior position; and that it corrects itself. The gravity of doing what has been proposed by Dr. Pomeroy, with which I was familiar, having heard his paper originally (and which is not proposed by Dr. De Lee), is great. It is a procedure which in a large number of obstetrical cases will not be necessary. Given an occiput posterior in a woman with plenty of room if she be let alone until the head is in the excavation of the pelvis, with the ordinary mechanism of labor, if there be good flexion and strong pains, it will rotate to the front to such an extent that a little art will, if necessary, deliver the patient. In trying to teach the use of forceps in occiput posterior cases I have always made the statement that forceps were indicated, or can be used, not because of the occiput posterior position, but in spite of the occiput posterior position, and for a different indication." After some further remarks along this line, the doctor continued, saying:

"The third section of the paper, which has to do with the subject of fetal life during the second stage of labor, is another problem which, fortunately, seems more easy of solution than the problem of the correction of malposition. One needs to learn but one thing and when he knows that this life which is in jeopardy can be saved by appropriate measures and that the only way to do that is by watching the fetal heart sounds, he has learned something which immediately advances him in his art.

"I do not know that I have ever heard or seen anything that pleased me more than the instrument which Dr. De Lee has presented to us. I think it is perfectly splendid. I think it will result in the immediate saving of a great many children who would be lost simply because the men didn't know enough to watch the fetal heart beat. We are very fortunate in being here tonight to hear this one thing if we heard nothing else."

Dr. George H. Ryder.—"With regard to the second part of the paper, occiput posterior positions; I also think, as Dr. Flint has said, that early in labor it is not only very difficult to find out whether the occiput is posterior or not, but even if you do know that it is posterior, it seems that it is unnecessary to correct it. I cannot see why a head which is posterior won't come into the pelvis as well in that position as if it were anterior. I cannot see any structure in the pelvis to prevent it. It is when it is in the pelvis and does not rotate that we have trouble. I believe in waiting until the cervix is almost fully dilated and then rotate the head, if necessary with the whole hand in the uterus. I find that is almost always very easy, but to make a diagnosis of occiput posterior until the cervix is almost dilated, I confess I am almost unable to do that. Having turned the head around, instead of using the ingenious method which Dr. De Lee has spoken of, I have found the method of Dr. Pomeroy very useful. If the position is an R. O. P. do not convert it to an R. O. A., but, on the other hand, convert it to an L. O. A. and the head will be in the same oblique as formerly and it will almost always stay there and you can put on the forceps very easily."

Dr. Franklin A. Dorman.—"I have always felt that there was great danger in attempting to create a wide aseptic field and I distrust sterile sheets and the confidence they engender in doctors and nurses, particularly in house work, where a nurse feels that if she provides a couple of sterile sheets and a few other things she has covered the field because, as Dr. De Lee states, those are soon foul from the activity of the woman in her movements. I think the sterile leggings also possess a danger and that they inspire a false spirit of confidence in several ways. For that reason I regard them merely as a precaution and not a necessity and do not regard them as sterile after they are worn a short time. I do not believe in donning a sterile suit until the woman is near delivery. I do not believe in preparing for an aseptic operation until the woman is reasonably near delivery. I believe that to try to preserve aseptic precautions is a dangerous thing. I do not believe in preparing our patients until the very last moment of delivery and believe that the short aseptic field is the proper one. I think the abdominal wall should be made sterile by towels.

"With regard to the question of the delivery of occiput posterior positions. I believe that it is one of the gravest obstetric problems that we face. I believe that too much stress is laid upon the risk of the unengaged head. I think that one-half of our cases in the pelvis are occiput posterior and that they correct themselves, and that there is any necessity for correcting the head before it engages I cannot see. I know it is argued, but have never seen it. When we get a persistent posterior and place the head forward and it immediately recurs we have to have some method of holding that anteriorly. I believe it safer to rotate it in a smaller arc; that is from R. O. P. to R. O. A. I believe that in the majority of cases the head may be maintained. If we have to use forceps we can introduce the right blade and hold the head above, using that as a support. It seems to me that this scheme is very ingenious and may be extremely useful in some cases.

"I want to state here that it is my belief that the Scanzoni operation is of extreme value in some cases. There are, however, two or three things which are to be insisted upon. Head and shoulder blades should be used and the operator should understand the arc or circle through which he must carry the handles of the forceps and extreme gentleness should be used. I think it would be very deplorable to absolutely condemn the Scanzoni operation, and I believe if we absolutely throw it out we will have a certain number of cases in which much more harm will be done to the levator muscles by a persistent head coming through as such."

Dr. Ralph M. Beach.—"There are two points in regard to this problem of asepsis that I would like to lay emphasis on. The first one is the preparation of the woman. It seems that in our modern obstetric cases we have gotten to the best point—the last word practically, by the use of rubber gloves. We wash our hands and put on sterile gloves, but how many times do we pay even minute attention to the woman? If we wear sterile gloves and get infections it must be from lack of preparation of the woman's genitals. How many times do we see patients in consultation and we ask the doctor if he has been clean with his examination and he replies that he has; that he has used gloves and given lysol and so on, and when you look at the patient you find that she has had no preparation whatsoever? I believe that the majority of cases which become infected become infected on primary examination, whether it be in the hospital or in the home. How many times does the family physician see cases and after being there for ten or fifteen minutes concludes that it is not necessary to remain, but before going makes it a point to determine what the condition of the cervix is? I believe the family physician in cases where sepsis occurs frequently infects the woman himself.

"In our operative technic at the Long Island College Hospital we have been making use of rectal examinations and I wish to say that I cannot emphasize too much the value of that procedure. We have had case after case in which that method of examination has been followed with success. I recall one case where it was necessary to put a bag into the cervix. That was the only manipulation by way of the vagina that was necessary and the entire course of the labor after that was followed by the rectum. By rectal examination you can determine the position, dilatation, descent and practically everything that can be determined by way of the vagina. All of our cases are followed by rectal examination. There is only one thing that we cannot tell, and that is the dilatability of a given cervix. By this method we are able to do away with a great deal of scrubbing. It is our practice to put on an ordinary glove, lubricate a finger with vaseline, make a rectal examination and not enter the vaginal field at all."

Dr. Asa B. Davis.—"I am very glad to hear such special stress laid upon the aseptic treatment of obstetric cases. I take a rather more hopeful view, despite the statistics which have been given here. I believe in looking back over a period of years that there has been, in this city at least, a decided improvement in the matter of infected cases and in the mortality also. The morbidity may not have been reduced, but as we see it in the Lying-In Hospital service the cases coming in there are nothing like the terrible cases we used to see. One whole ward was formerly set aside for aseptic cases. We do not see those cases in consultation. They must go somewhere else or else they don't occur. There is still room for great improvement. In our outdoor service our statistician tells us that in a delivery of something over 3000 cases there wasn't a maternal death. The morbidity I know is not very high. In the outdoor department we do not use cloths or sterile sheets, but in some way we are successful in taking care of these people in filthy homes, as filthy as any that can be found.

"With regard to occiput posterior positions: I believe Dr. Flint and Dr. Ryder said there are a great many more of them than are recognized and the very large majority take care of themselves spontaneously. There are, however, a few such cases that are very difficult to treat and I do not think you can say what should be done for every case. They must be individualized. The control or watchfulness we have recognized, especially in our indoor service, and I believe we have been able to save many lives that would otherwise have been sacrificed, especially in the last part of the second stage of labor."

Dr. Joseph Brettauer.—"May I ask Dr. De Lee in his closing remarks to tell us if he can, about what percentage of babies are lost during the last part of the second stage of labor?"

Dr. Joseph B. De Lee.—"I cannot answer Dr. Brettauer's question because it is to difficult and involves too careful a garnering of statistics, but I can say that possibly every six months in our hospital in the hands of internes or the attending men, a baby is born dead for no apparent reason. The heart sounds were heard shortly before delivery and yet the baby is stillborn. In fact, to justify the strong emphasis which I would like to place on this particular point, I will begin at the end rather than the beginning and talk about the instrument. This is one of the experimental instruments, being the third design. The first was made by Dr. Hillis; the second I made, and this is the third, improved one." At this point the doctor went on to explain that the instrument could be so arranged that it would be adaptable to the physical peculiarities of the head of the physician who happened to be using it. Continuing along this line, Dr. De Lee said: "This headband can be made with a swivel joint in the middle so that it can be twisted around to reduced size for carrying in your satchel. The idea is there and I don't doubt but that some mechanical genius will improve on it and make it more usable. I may say in addition, that I have learned a whole lot about fetal heart tones since I have been using the instrument. I learned that we got a little panicky once in a while and delivered the baby when the heart tones were very irregular, yet the child was well when born. In normal second stages the fetal heart tones may drop below 100, and it requires study to determine the existence of fetal danger. We must refine our diagnosis of intrauterine asphyxia a little more. I think that we must experiment to gain knowledge.

"Regarding the Scanzoni method, I disagree with Dr. Dorman. I have seen Scanzoni's operation performed by experts and have noted the terrible injuries resulting therefrom, and I say that when a Scanzoni can be done at all, the rotation of the head can be accomplished as easily with the fingers.

"Dr. Beach spoke about rectal examinations. I had hoped that rectal examinations had already, in this short period, obtained a recognized and unquestioned place in obstetrics. I disagree with Dr. Beach. One can tell very often (in the majority of cases) whether a cervix is dilatable. One does not need to spread it. One can tell whether it is hard or soft. When soft it is dilatable as a rule, and when hard it is not dilatable. I hope you will believe me when I tell you that I have had two cases of placenta previa which were diagnosed by rectal examination; not alone the placenta previa, but the degree of placenta previa. In those two cases I used the rectal examination to decide the indication for the course which was pursued. In one case I decided to do a Cesarean section and in the other, not to do a Cesarean section, delivering the baby from below. It was a very simple matter.

"I disagree with Dr. Beach also about the nonsterile gloves. I think we should take a sterile glove because once in a while the woman tosses about a little and the thumb goes into the vagina.

"If the Secretary will hand me my paper I will reread what I said about the treatment of occiput posterior. I am very keen on that. I believe you will see that the position I take is the one that the majority of the gentlemen who have discussed it have taken: "'*The Correction of Abnormal Positions and Attitudes of the Child Preparatory to Delivery.*

"'Text-books, generally, state that occiput posterior positions in the majority of cases terminate spontaneously and happily for the mother and child. The minority of cases of occiput posterior positions that persist and require the assistance of art is of considerable importance. If we add to these those cases ("Here comes Dr. Flint's opinion") where ill-timed and illy-executed interference ("That is what I objected to") is made, we have one explanation of the high infantile mortality in birth, and for injuries of the maternal soft parts, with or without infection, and the inevitable permanent invalidism therefrom. I feel sure that more children die as the result of improperly managed occiput posterior positions than are saved by Cesarean section, performed, as it is to-day, on the most flimsy indication.

"' Two classes of cases present themselves—those where the head does not engage and those where engagement has occurred but the occiput does not rotate to the front, even during a prolonged watchful expectancy. One should have great patience, however. The bag of waters is to be preserved until dilatation is complete. A thorough examination should be made to determine the cause of the posterior position and of the delay—perhaps this cause would have given an indication for Cesarean section if it had been discovered in time.

"'If it becomes necessary to interfere before the head is engaged, in multiparæ version is the operation of choice—in primiparæ version is not a good operation. Most of the cases of persistent occiput posterior occur in primiparæ; therefore, since version is not a good operation we must use something else. I usually twist the child in the uterus (as Dr. Pomeroy does, but not to 180 degrees: I am afraid to do it in those cases because prolapse of the cord occurs once in a while), passing the hand well above the promontory operating mainly on the trunk, bringing the back well to the front; then I draw the head into the pelvis with forceps, leave the case to Nature—or to follow a subsequent indication. Very often I finally have to deliver the patient by art, but the delay has secured a great gain—the head has become moulded to the pelvis in its new position, the cervix and pelvic connective tissues have been drawn up out of the way; the pelvic floor has been prepared for the delivery—by being softened and partly dilated, and thus a formidable "high forceps operation" is replaced by a relatively simple low, or, at most, midplane delivery. While this two-stage operation is very distressing to the patient, involving usually two anesthetics, and is very wasteful of the surgeon's time, the advantages are very considerable.

"'In those cases where the head is engaged one may seek to turn the occiput to the front by combined manipulation, working on the head within and without at the same time. Formerly I recommended pushing the head up out of the pelvis and performing the maneuver described on the floating head, but in one case while doing this the cord prolapsed and I had great trouble in saving the child. The difficulty has usually been, not to turn the occiput to the pubis, but to hold it there until I could get the forceps securely applied to the sides of the fetal head. The assistant, operating from without, seldom succeeded in holding the head in position for the few seconds required. I want to ask you all to try it. It is a very simple maneuver. You will be surprised to see how easy and successful it is.

Joint Meeting with the PHILADELPHIA OBSTETRICAL SOCIETY, *April* 10, 1917.

The President, JOHN O. POLAK, M.D., *in the Chair*.

DR. BARTON COOKE HIRST presented a paper on

TREATMENT OF INJURIES OF THE BIRTH CANAL.*

DR. POOL read a paper on

THE IMMEDIATE REPAIR OF THE INJURIES OF PARTURITION.†

DISCUSSION.

DR. G. C. CHILD, JR.—I have been a teacher of obstetrics in New York City since last October, at which time I was asked to take charge of the maternity service at the Polyclinic Medical School and Hospital, although I have practised obstetrics for twenty years. There are one or two points only which I would like to discuss in Dr. Hirst's paper. I believe firmly in the primary repair of childbirth injuries. I believe that the time to repair any such damage is the time it occurs, if there are not some very strong reasons to the contrary. The tissues most frequently needing repair are the cervix and perineum. I do not believe that the repair of the cervix creates any added danger of infection when done primarily. I believe that surgery is clean enough to do this in obstetrics as well as in other lines, so that we do not need to be deterred from doing work that is imperative by the fear of a possible infection arising. The great difficulty in primary repair of the cervix is its inaccessibility. To be sure, in most deliveries the cervix lies well down near the outlet and can be further drawn down by a pair of bullet forceps and easily reached, especially if it is done before the placenta is expelled. Where sutures are introduced I would introduce them before the placenta is expelled. Most lacerations of the cervix due to childbirth are difficult to prevent. No so, however, with lacerations of the perineum. I believe the great majority of lacerations of the perineum are preventable. The method which I consider accomplishes this result is not the median line incision which Dr. Pool mentioned, but episiotomy, an old and valuable surgical procedure in obstetrics, done on the right side or the left side of the outlet, or on both sides according to the space which is desired. I feel that episiotomy if properly done will save any further laceration of the perineum. It should be done before the vulva has become very much distended.

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* For original article, see page 50.

† For original article see page 53.

Dr. George M. Boyd.—I think we all realize how difficult it is to get a satisfactory result in our primary work in obstetrics, but in spite of those difficulties it has been my custom to make and to teach a primary repair. If it were not for the edematous condition of the tissues, if it were not for the changes in the tissues associated with pregnancy, it seems to me that we would all agree as to the surgical wisdom of making an immediate repair.

The injuries of the cervix and the perineum, I think, we all feel can be, in a sense, prevented and are probably increased in magnitude and in variety because of the temperament of the average American obstetrician and the desire to hurry through our work—induction of labor, manual dilatation, pituitary extract and the like.

Now, while that seems to me to be the proper course to pursue, we do not always get the satisfactory results that we wish for. I would hesitate, however, to permit a woman with a complete tear to go a week or ten days, for fear of infection. Secondary or immediate repair depends upon the degree of injury.

I take it that Dr. Hirst would repair the slight injury requiring one or two stitches, only necessary for its cosmetic effect or the closing of a gaping wound, although I confess it is difficult to see immediately after delivery just how great an injury exists beneath the mucosa. The difficulty that I have encountered in connection with the intermediate operation has been, in suggesting operative interference a week after delivery. I find even in ward patients an objection to the repair and in some patients a flat refusal, so that as I look upon it to-day I feel that in my own hands (my own cases) I will make an immediate repair in the majority of cases, and if I feel that that immediate repair will not be a successful one, or if there exists a doubt about its ultimate success, it seems to me that it is not wrong and that it would be fair to the patient to explain the situation and failing in that immediate repair, make at a later date (a week or ten days) a secondary repair.

Dr. W. S. Stone.—There is one point in Dr. Hirst's argument that I will briefly discuss, which relates to the diagnosis of the character of the injury, the importance of which has been emphasized by Dr. Hirst. My early experience was obtained in a large gynecological clinic in which I saw the results of these injuries after varying periods of time. I soon learned that I did not know how to repair them and I saw very few others who did. My subsequent experience in the Lying-In Hospital, in which I had the opportunity to study the injuries immediately after they occurred, showed me more accurately the nature of the different kinds of injuries which occur to the perineal floor. It seems to me, therefore, that his argument for delay in repair in order to thus better judge of the nature of the injury is not altogether a good one. I believe that we can best make a diagnosis immediately after the injury has occurred and therefore, are then in the best position to make the repair.

Dr. R. H. Pomeroy.—There are some fallacies of the situation that we haven't looked into. The first definite fallacy has always appeared to me that we are carried away by the idea which has already been hinted at by Dr. Pool, namely, that we are responsible for the incompetence of the pelvic floor, whether we repair the obvious wounds or do not repair them. Personally, I think we have forgotten, and persistently forget, that the real problem is how to arrange for a woman to bear a child with a large head and continue to walk thereafter in the upright position, and that that problem is a great deal more of a factor in the question of pelvic herniæ of all kinds than the question of whether we repair or do not repair the obvious wounds immediately after labor. In other words, we have solved the problem not at all until we have solved the problem of how to escape with a minimum of destruction of the structures that do not prove elastic in themselves. Any surgeon will admit the proposition that an incision will heal up much better and with less destruction than a lacerated wound giving way under tension.

The other fallacy in this thought is the failure to recognize the fact that every primipara is entitled to be converted into a competent multipara. In other words, there is a change of type. If a woman is only to have one child the question is debatable as to whether she had better have it by Cesarean section *a là* Davis or whether she had better have by the intermediate repair of Dr. Hirst or any other process which converts her into a complete multipara. All of us see multiparæ with evidences of genital wounds in all parts of the parturient canal from the cervix to the outlet, who have no procidentia and no malposition or hernia or descent of any organ because the muscular structures have not been damaged.

My own thought in trying to solve the same problem which Dr. Hirst has saved the face of by announcing beforehand that he is going to repair the damage one week after delivery—my own thought is to prolong the first stage, if it is necessary to prolong it, and to shorten the second stage, if it is necessary to shorten it, by incision.

At this point in his remarks, Dr. Pomeroy stated that there were two propositions to be advanced in connection with the question of "how we are dealing with the passage of the head or the fetus as a whole through the vaginal outlet—one in which we protect and allow the extraction without any distention preparation, and one in which the natural forces are allowed to go as far as they may without obvious evidence of wounding." Continuing his remarks, the doctor went on to say: Cutting that discussion short and coming again to the point of saving what can be saved at the outlet without unnecessary stretching and tension and destruction of the median section from the levators, it has appealed to me for a number of years that by incising the perineum in the median line, as Dr. Pool has suggested, after the distention of the perineum has reached the point that shows that there is going to be further laceration by the appearance of blood and by putting the head back in the intervals of pain and observing that the vaginal mucous membrane is already beginning to tear in one sulcus or in the median line and immediately sacrificing the muscles in the median line with the idea of sewing them up again immediately after the delivery, such a procedure might be of help. My own technic in that problem involves also a preliminary full dilatation of the sphincter ani before the incision is made. After the sphincter ani is thoroughly stretched then the incision is made, which can be done in a few minutes, because even if your median incision goes through the sphincter the repair is absolutely innocent of any problem. Once in a while it fails, but the preliminary dilatation of the sphincter ani gives you a relaxed muscle springing away from the point of incision and laceration and simplifies the repair exceedingly.

I still have a feeling that while Dr. Hirst's thesis is entirely defensible as a procedure, there is still a combination of premises in the subject. If he were to sanction the repair of the obvious wounds as a primary procedure and then do what was necessary a week later, if he thinks best, reconstructing the pelvic floor and making a competent cure of a hernia, then his position is certainly defensible.

Dr. Hirst.—I feel that the questions which I have raised have not been satisfactorily answered and the best proof of this is in the fact that my office is crowded every afternoon with women with defective pelvic floors, the result of primary repair of lacerations of the birth canal. This primary repair is not new. It has had a trial of at least a generation and is a failure. Are we going to continue as we have been doing for the past thirty-five years? We have made no progress and it seems to me that something ought to be done. This question is the largest in gynecology to-day. More than half of our gynecological patients are suffering from pelvic defects. We should seriously consider this matter and strive to achieve some progress. I would like this thought to be carried away by the members of the combined societies. Let us seriously consider the results of our work and how it may be improved.

Dr. Pool.—I would like to ask Dr. Hirst one question. Does he believe that if his technic were carried out by the same men who are getting poor results with the primary repair and filling his office with patients, their results would be any better?

Dr. Hirst (answering Dr. Pool's question).—We strive to make them do it by teaching our students to do better. Our students in the University Hospital are encouraged to do better work than their predecessors. Every member of the graduating class is made to serve as an assistant in a number of the operations and as a result we are turning out physicians who are perfectly competent to do this work. The teachers of obstetrics throughout the country should do the same thing, but the students in our medical schools are not getting the training they should. In a personal investigation of the principal medical schools of the country, it has seemed to me that in many the training of the students in repair of the injuries of childbirth is defective.

Dr. Pool.—It was with the thought of what we should teach the student that I asked the question, as this seems to me an important feature of the discussion. We may teach our students ever so carefully; we may load them up with all the lore of the modern science of obstetrics, and many of them must go out and face conditions in which they find it very difficult to put all these things into practice. It is useless to say that unless a man can practice obstetrics properly, he should not practice it at all. These young men must do obstetric work, and they must do it where they find it and as they find it.

In New York City there are many more babies born in tenement houses than in brown stone fronts or in hospitals. When these cases have a doctor it is the general practitioner who attends them. The average fee is from $15.00 to $25.00, and a trained nurse is practically unknown. Is it not asking a great deal of a physician, who has delivered his patient and seen her well on toward recovery, to expect him to return to her and operate, bringing with him one or two assistants and a nurse provided at his own expense, since the resources of the family have already been strained in paying his original fee? Would it not require a high degree of enthusiasm and devotion in him to do this thing whenever a perineum is torn? Conditions may be different in Philadelphia, but here I doubt if we can expect the doctor to adhere to such a practice as a routine procedure. I doubt if he will be willing to take many an obstetric case, watch his patient throughout pregnancy, make a number of antepartum examinations, keep tract of her blood pressure, and her secretions, spend the night with her during her confinement, attend her for a week or so in the puerperium, and then operate her with the help of two or three assistants paid for by himself, and finally continue his ministrations until she is entirely recovered, his sole honorarium being $15.00

This is not meant as a plea that, because obstetrics is badly paid, it should be badly practised, but it is a feature of the question which, I think, the teacher must take into account.

Another objection touched upon by Dr. Hirst is that of the patient herself. Among the poor the element of time is particularly important, and many women in that class are opposed to anything which will prolong the period of the lying-in. I have seen several cases in which the doctor had intended in all good faith, to do a later repair, but had been prevented from doing so by the objection of the patient. Of course the last state of such a case is worse than if even an imperfect immediate repair had been done. Since there are, at the present time, conditions in obstetric practice which we cannot entirely change, is it not well to modify our teaching to meet these conditions, as far as possible? To simplify technic as far as we may, rather than to add to its detail? Will it not give better results, in the long run, to teach the student to differentiate these cases of laceration, to teach him to recognize the case, which, if repaired immediately, will fall within the 50 per cent. of favorable results mentioned by Dr. Hirst, and to recognize the case in which he cannot possibly hope to get a good result, if he repairs at once? And then to teach him how to do this operation; to make him understand that simply placing a few sutures in a hole he finds in the pelvic floor, is not necessarily repairing that rent? I believe that with a proper understanding of the principles, and an adherence to the proper technic of the operation, the percentage of satisfactory results following immediate repair may be greatly increased, and that the method of operation rather than the time of operation is of the first importance.

DR. HIRST.—I can merely add that we are doing this work in a clinic of some 2000 cases a year, representing women of all classes, ranging from women of the slums to women of the well-to-do class.

DR. RALPH M. BEACH presented a paper on

THE RESULTS OF THE TREATMENT OF PLACENTA PREVIA.*

DISCUSSION.

DR. JOHN A. MCGLINN.—I think that instead of speaking about the indications for abdominal Cesarean section in placenta previa we should speak about the contraindications for abdominal Cesarean section. I do not believe that we can discount entirely the life of the baby in placenta previa. I think we must consider the life of the mother and that of the baby as well. Abdominal Cesarean section, if there are no contraindications to it, certainly conserves the life of the baby, and I believe that in the average case it will conserve the life of the mother as well as any other treatment which we may carry out.

It happens that, not infrequently, in the majority of cases that arrive in the hospital abdominal Cesarean section is contraindicated because the majority of them have been unduly handled and they are presumably infected, and also the majority of them have been tamponed and also presumably infected; and I certainly agree that as far as tamponing every case on the slightest appearance of hemorrhage is concerned that it is a bad thing because in the cases which we see so frequently in placenta previa there has been no attempt made to sterilize the external genitalia and as the result of contact with the hands and packing the patient comes into the hospital infected. This is a condition in which you are up against a high maternal mortality on account of infection. Nevertheless, if we can teach that these cases when first seen can be operated upon without handling and packing, and that abdominal Cesarean section would conserve the life of both the mother and baby as well, I think we would be doing a great thing for this subject of placenta previa.

As far as statistics are concerned, I personally believe that statistics in a certain line of cases, taking, say, 50 or 100 cases, do not mean very much unless you know just exactly the history of each individual case. For instance, Peterson's cases of abdominal Cesarean section in eclampsia, in which he reports about 50 per cent. maternal mortality, do not mean anything. You must know the conditions you have to meet in the individual case.

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*For original article see page 57.

I personally do not believe in the extraovular introduction of the bag. I believe that in the partial or central type this method tends to increase the hemorrhage. With the intraovular application of the bag the placental hemorrhage is controlled by compressing the placenta down in close approximation to the uterine wall.

I have done Cesarean section in a number of cases. I did one Saturday night in which the patient was almost moribund. The cervix in that case was rigid and undilatable, so much so that it was impossible to get a place to dilate it. She had been handled and packed for twenty-four hours and had repeated hemorrhages in spite of the packing. Notwithstanding the desperate condition of the patient, I transfused her and sectioned her and got a live baby and a live mother. She is doing well.

I do not fear in these acute cases anything as far as the hemoglobin or red cells are concerned. They recover quickly. We must fear the danger of infection from handling.

Personally, I do not see very much use in vaginal Cesarean section for placenta previa except in the early cases, but surely in the late cases you have a favorable operation; and where every bit of blood counts there is a bloody operation and you are increasing the bleeding; and in those cases which have been handled to a great extent in which the cervix is dilated or readily dilatable, then the introduction of the bag followed by version, or, in the beginning, if you have sufficient dilatation, the use of the Braxton-Hicks method is, I think, the proper thing. Nevertheless, I am fully satisfied in my own mind that if abdominal Cesarean section is done at the proper time it is the operation *par excellence.*

DR. GEO. H. RYDER.—It seems to me that in discussing the treatment of placenta previa, it is essential to mention the kind of placenta previa with which we are dealing. The treatment of a complete placenta previa is very different from that of a marginal or a lateral placenta previa. A complete placenta previa is one of the most serious complications of childbirth. A high lateral placenta previa is often of such slight significance that it needs no treatment or consideration whatsoever. Between these two extremes there is every grade of placenta previa, varying in severity according to its location. Therefore no discussion of the treatment of placenta previa as a whole is profitable. The treatment should be clearly divided into that of lateral placenta previa, marginal placenta previa, and complete placenta previa.

The President has asked my opinion of the value of bags in the extraovular method in placenta previa. I prefer the extraovular method to the intraovular method. The bag is more easily inserted, it causes less bleeding while being inserted, and after being inserted it stops the bleeding. It does this by stimulating uterine contractions. These crowd the presenting part down, and the placenta is compressed between this and the bag. Thus the hemorrhage is controlled. In the Sloane Hospital this is the method of procedure in severe cases of placenta previa. The largest sized bag possible is inserted at once, outside of the placenta. The patient is watched carefully till the bag comes through the cervix, when a larger bag is inserted. After the largest bag is expelled, by a version the foot is pulled down through the cervix. Delivery is slow, so as not to tear the cervix. After delivery, the placenta is extracted and the uterus is packed. The bag in the extraovular method stops the hemorrhage satisfactorily.

DR. J. O. ARNOLD.—I have had some experience in the treatment of placenta previa and have practised the various methods which have been mentioned. It seems to me the discussion should deal with the method that can best be used by the man who sees these cases first. The welfare of the woman having placenta previa depends upon the man who sees her first, and that is the general practitioner in the large majority of cases. What can the general practitioner be taught to do at the time he sees these cases, that will produce the best results? Most of his cases are seen in the home and he cannot do Cesarean section there. If he attempts to do the Braxton-Hicks procedure he will probably fail. Very few general practitioners are capable of doing the Braxton-Hicks version. They do the ordinary podalic version instead and in so doing are very apt to tear the cervix and to so hasten the delivery that it amounts to accouchement forcé, which is to be condemned at any time. As a rule he has not the bag with him and about the only thing, therefore, that he can do, and that we should teach him how to do right, is the use of the tampon. I still believe that the proper use of the tampon will control hemorrhage in the majority of cases and will more safely secure dilatation than most other methods. In hospital practice I have had good results with Cesarean section, with the bags, and with the Braxton-Hicks version, but the practical thing is to teach our students and the general practitioner how to safely and effectively use the tampon.

DR. DANIEL LONGAKER.—There is very little to be added to the very excellent paper which Dr. Beach has given us. Dr. Arnold has discussed the subject from the viewpoint of the general practitioner. If there is one hint that should be given the general practitioner it is the very easy way of dilating many of these cases. In multiparous women in the early stage of incipient labor a very easy thing is to rupture the membranes and give an ampule of pituitrin. Again and again I have tried this trick when called in consultation and it has been all that was necessary. I recall one case of twins in a multipara. I simply ruptured the membranes and gave pituitrin. Within fifteen minutes the first baby was born and the second one came along very shortly afterward, both of them living. Referring to the matter of Braxton-Hicks version, I did this many times when I was a general practitioner and did not find it difficult. I never use the tampon as I look upon it as a dangerous thing.

DR. A. B. DAVIS.—I think the essential thing is to differentiate between the varieties of placenta previa. That is, there is a wide diversity of the complications and tears possible in the different cases. For instance, a week ago Monday I delivered a case (a multipara) that came into the hospital on March 16th. She had had several hemorrhages. She was in fair condition. She was not bleeding. We watched her until a week ago Monday when she began to bleed. There was two fingers' dilatation in that case. She was easily dilatable. We did a manual dilatation and got a living child. I examined the cervix afterward and there was very little laceration, but that will not hold true in many of the other cases. On the other hand we had a primipara a while ago who had been kept under the care of a general practitioner for nearly two weeks. She was bleeding from time to time. Sometimes she would merely stain and then again she would lose considerable blood. I think those cases are not cases for the general practitioner who may happen to see them. They are either hospital cases or should be delivered without delay. This patient was in the hospital two weeks and suddenly had a hemorrhage weighing 2 pounds and 6 ounces. She then stopped bleeding. They usually do stop bleeding but some of them do not. In that case I did an abdominal Cesarean section and the mother and child are both alive.

We do not do abdominal Cesarean section in every case of placenta previa by any means. We did over sixty abdominal Cesarean sections in the last sixteen months and only two were in cases of placenta previa. We have had a good many more cases of placenta previa than that.

I am afraid of the bag cases. I do not like the tampon. I lost two cases of Cesarean section from infection by the tampon, and I have seen others infected where we had done the packing ourselves.

I think the cases vary so much in the degree of danger that it is very difficult to say what to do, even though I think Dr. Beach has clarified the situation very much in classifying them. The consideration of the individual case is the essential thing and, as Dr. McGlinn stated, statistics on these cases do not mean anything, or, at least, very little, because by taking a group of 100 cases it will be found that the points in which they are similar are very few.

Dr. Beach.—I think the point made by Dr. Arnold relative to the general practitioner, is a good one. The general practitioner has really nothing to use in these cases at home except the tampon, and they all make some attempt to tampon every case. It seems to me that it is extremely essential that teachers of obstetrics should teach these practitioners and the students also how to tampon these cases so that the tampon will be productive of results. The majority of these cases coming into my service at the hospital have about 6 feet of a 2-inch roller bandage in the vagina. The vulva has not been cleansed or shaved. Immediately that such cases get to the hospital they are considered to be septic and to be bad operative risks for abdominal section. If we are going to get results in these cases we must teach the general practitioner to shave in all cases and to cleanse them with soap and water and bichloride and tampon in the knee-chest position, and to put plenty of gauze in the vagina.

TRANSACTIONS OF THE BROOKLYN GYNECOLOGICAL SOCIETY.

Meeting of February 2, 1917.

The President, CLARENCE E. HYDE, M. D., *in the Chair.*

DR. VICTOR L. ZIMMERMANN reported three cases illustrating different

TYPES OF UTERINE CARCINOMA.

CASE I.—Mrs. A. R., aged thirty-eight; married first at eighteen and had three abortions. Married a second time two years ago; not pregnant since. Operated upon in Jefferson Hospital, Philadelphia, in 1895, for some ovarian trouble. Family history negative. Menstrual history: began at fourteen, twenty-one-day type, lasting five days. For past year has had menorrhagia and metrorrhagia, flowing three days every two weeks. Present illness dates back about two years when she started with anomalous menstruation. This continued until nine months ago when she was curetted by her family doctor which stopped her bleeding for three weeks, when it began as before, except in larger quantities and longer duration. She then came to my service in St. Mary's Hospital in September last. Examination showed a fairly well-nourished white woman, weight 135 pounds. Heart, lungs, and kidneys negative; hemoglobin 65 per cent. Abdomen shows a well-healed median scar; no tenderness; vaginal examination shows a very large cervix, filling upper part of vagina, but intact, that is, no break in the mucous membrane; it was irregular in spots, shiny and dark red in color. The fundus was small and freely movable. A moderate amount of bright red blood was coming from the external os. On the left side a small mass could be felt just at the upper part of the enlarged cervix. The vaginal covering of the rectum was thickened and the growth had evidently invaded the vaginal wall at the junction of bladder and cervix. On September 20, 1916, I attempted to do a high amputation according to Byrne, but on attempting to grasp the cervix the mass was so friable that most of it was torn off. I removed what I could with the cautery knife and cauterized the stump. After this she left the hospital, gained 22 pounds and had no bleeding until the latter part of December, when it came on after coitus. She then began to complain of pain for the first time. She returned to the hospital and I operated again January 9. At that time under ether examination showed a friable growth just at vault of vagina, coming from high up near the internal os and involving the vagina over the bladder edge. I curretted away the loose mass, cauterized it and put in a pack. I then opened the abdomen by a long incision. The omentum and sigmoid were adherent to the left side of the fundus uteri. The left appendages had been removed at a previous operation. There were numerous enlarged glands along the left iliac. The left adnexa were freed from light adhesions. The ovarian and uterine vessels were tied as far out near their origin as possible, clamps were placed on both sides and the incision made between them with the cautery knife on both sides, this was carried down to the vagina which was also cut away with the cautery. The broad ligaments were sewed over in the usual way and the vagina closed with two sutures, leaving a space for gauze drainage. The specimen was reported as an adenocarcinoma.

Case II.—Mrs. C., aged fifty-three years; widow. Family history good. Was never ill until eight years ago when she began with anomalous menstruation for four months and then had a continuous and very profuse flow of blood which confined her to bed and greatly exhausted her. Her hemoglobin was 40 per cent. When she came to my service in St. Mary's Hospital she had a uterus which was only moderately enlarged, freely movable cervix, and its canal was patulous and easily dilated; she bled quite freely on manipulation. Under ether about one-half teacupful of material was removed with the sharp curet, a tight pack applied with styptic for a few minutes and the cautery dome applied to the fundus. The pathologist reported an adenocarcinoma. Her bleeding stopped, she gained in strength and left the hospital promising to return for another operation. She did not return and the next time I saw her was six years later. She said she had had no bleeding and had felt very well up to three months ago when she began to have irregular flowing of blood and a continuous, brownish-yellow, burning leukorrhea. She looked well and had gained 30 pounds in weight since the last operation. Examination showed the cervix small and rather low in the pelvis. The fundus was the size of a grape fruit and a small fibroid could be felt on the left side; adnexa seemed normal; uterus of fair mobility. In June, 1915, I opened her abdomen. There were a few adhesions of intestines in the left broad ligament. The fundus of the enlarged uterus was light in color and the peritoneum was drawn tense over it, which resembled the contraction of the skin over a healed burn on the surface. The wall of the fundus under this area was very thin and the entire uterus soft, except on the left near the fibroid. I did a panhysterectomy. When I had removed down to the cervix the fundus seemed about to rupture so I amputated at the cervix and then removed the cervix down to the vagina. No enlarged glands were felt. Dr. Hulst reported the cervix normal and the fundus the seat of adenocarcinoma.

Case III.—Mrs. F., aged thirty-eight years, mother of four children, the last two years ago. Family history negative. Personal history: always well until two years ago when she was operated upon for an infected gall-bladder. From this she recovered and was in fair health except for indigestion. Three months prior to her admission to the hospital, last November, she had a miscarriage at three and one-half months. After continuing to bleed for several weeks irregularly she was curetted with a dull, serrated curet by her family doctor. Relief was had from bleeding for about three weeks when a profuse, bright red flow began again and had kept up for two weeks. Examination showed a thin white woman, weight 120 pounds, heart and lungs negative; a healed scar in upper right abdomen; right kidney easily palpable; enteroptosis; hemoglobin 60 per cent. Vaginal examination shows a relaxed outlet; clots in vagina; cervix deeply lacerated; uterus only moderately enlarged and in first degree retroversion and movable. Under ether anesthesia the uterus was thoroughly curetted and a rough depression was easily felt with the curet at the right cornu. From this depression came away such suspicious looking material that a hysterectomy was deemed the most advisable procedure. This I did through the vagina in the manner advocated by Dr. Dickinson, by the use of two sutures, followed by general repair. Recovery was good. The specimen examined by Dr. Shirmer, who made numerous sections, is described as a chorioepithelioma.

DISCUSSION.

Dr. J. O. Polak.—Dr. Zimmermann's case brings up a case of considerable interest to me, showing how a woman past forty-five years, may be curetted four successive times for hemorrhage, without the specimens being submitted to a pathologist. This woman came to the College Hospital with a hemoglobin of 12 per cent., general hydremia, and had been curetted four times for persistent bleedings during three and one-half years. Yet she had a carcinoma of the body and the growth had not extended beyond the uterine cavity. This woman was transfused twice and her hemoglobin brought up to 40 per cent. She was then operated by vaginal hysterectomy and is still well. We have as yet been unable to teach the profession that whatever is taken out of the uterus must be examined, nor have we taught them how to take care of specimens so they are of any value to the pathologist.

Dr. W. B. Chase.—The case recited by Dr. Zimmerman of adenocarcinoma is of particular interest. The use of the thermocautery in such a case in the fundus and no recurrence for eight years shows the efficacy of this treatment and the case is rightly classed as cured.

Dr. Hussey presented a specimen of

FIBROMYOMA UTERI WITH ECTOPIC GESTATION.

Mrs. C. J., aged twenty-five years, widow; occupation, waitress. Admitted to the Brooklyn Hospital, January 2, 1917. Chief complaints were pain in the lower part of the abdomen and vaginal bleeding. Symptoms began on December 25th, with sudden, severe abdominal pain and bleeding. Pain came on in attacks lasting about one-half hour, at intervals of several hours. Pain on both sides radiating to the center. No nausea and faintness with the pains. Previous history: good health up to four years ago when she had an attack of abdominal pain with metrorrhagia for which she was operated upon at Panama. The operation gave relief from the symptoms. She was married one year; husband died six months ago. Denies intercourse for the last five months. Menstrual history: since operation menstruation regular until October 5; six days in duration, moderately painful; October period one day in duration, scant; November period the same; December period missed entirely. On December 25th began to flow with the onset of abdominal pain and has been flowing ever since; amount of flow moderate, two to three napkins a day; has passed blood in small clots but no tissue. Physical examination: well-developed negress; heart and lungs normal; breasts soft; pigmentation not distinctive; colostrum present. Abdomen hard, irregular, tumor felt in lower abdomen extending from symphysis to umbilicus, most prominent on left side. Bimanual, small vagina, soft cervix, os patulous, small polyp felt extending from cervix. Uterus irregularly enlarged, fundus tender, no Hegar's sign, many small, hard masses palpable. Adnexa not palpable. Considerable clear, bloody flow. Temperature 99⅖; pulse 100; urine negative; hemoglobin 68 per cent.; red blood cells, 4,900,000; white cells, 9,520; polys, 78 per cent.; lymphocytes, 8 large, 12 small. A clinical diagnosis of fibromata uteri was made, with probable coincident pregnancy, or possibly incomplete abortion. She had no signs of internal hemorrhage or collapse. The uterus was removed by a supravaginal hysterectomy and the report of the pathologist was myoma of the uterus with tubal gestation. The specimen is of interest merely as bearing on the subject of fibrosis as an etiological factor in ectopic. There are not many cases recorded. Is this because cases of fibromyoma and ectopic pregnancy are rare, or is it because they have not been reported?

Dr. Hyde.—There are some fine points of differential diagnosis where fibroids are found with ectopic. Fibroids with pregnancy are not rare but it is rare to find tubal pregnancy with fibroids.

Dr. Polak.—The study of gross specimens would be of more interest if pathologists would not hack up specimens so that they are difficult to examine. The relation between ectopic and fibroids is interesting and such cases are not remarkably uncommon. The relation is explained by the difference in length of the tube due to the presence of the fibroid. Any one who is doing much of this kind of work meets with the condition occasionally and the difference in length of tube in such cases is apparent.

DR. WILLIAM PFEIFFER reported a case of

ECLAMPSIA COMPLICATED BY ACCIDENTAL HEMORRHAGE AND FLAT PELVIS, POSTOPERATIVE PULMONARY EDEMA, INTESTINAL PARESIS AND LOCHIOMETRA.

Patient, aged twenty-four, a primagravida at term, admitted to Bushwick Hospital on night of Nov. 2, 1916, with a history from the physician who referred the case to me of moderate albuminuria for last few weeks, an ascending blood pressure, and persistent frontal headache for the day previous to admission. Pressure on admission was 165(S), 100(D). Free cathartics ordered as well as all measures to secure elimination by all channels. In spite of this the pressure rose next day, though the headache and albumin were less.

Early on morning of Nov. 4th, membranes ruptured spontaneously accompanied by pain and moderate amount of blood. Patient had a convulsion at 8.15 A. M., and was unconscious for five minutes, semicomatose for about twenty minutes. Rectal examination shortly after showed an uneffaced undilated cervix, cephalic presentation with head unengaged. Fetal heart obtained. Pressure at that time had dropped to 150(S), 90(D).

Pelvic measurements were: I.S. 23; I.C. 26.5; Ext. C. 17; L. O. & R. O. 22; Bis. Is. 10; A. P. of outlet 12. D. C. 11; C. V. (estimated) 9.5., indicating a simple flat pelvis.

In view of the flat pelvis, convulsion, undilated and uneffaced cervix in a primipara, with a strong desire for a living child, possibly also a beginning separation of a normally seated placenta, it was decided to do a Cesarean section by the abdominal route. The classical operation was done and a female weighing 7¾ pounds was delivered. Examination of placenta showed a slight separation its lower end.

The patient had been but slightly edematous prior to delivery and toxemia was probably of hepatic type.

The day following delivery there was considerable intestinal distention for which pituitrin was given and repeated at frequent intervals. The amount of ether used, 180 grams, for a forty minutes' operation, was too much and produced a bronchitis, which for a time threatened grave consequences. Twice pulmonary edema occurred but with further use of pituitrin, camphor, atropine, mustard pastes and cupping, was controlled. Frequent night sweats accompanying the bronchitis led to a rigid search by history and physical examination for an old tuberculosis lighted up, but with negative result.

The temperature up and climbing led to an inspection of the wound on the fifth day postoperative but it was found clean. Two days later one suture was removed and a probe passed to the fascia as the temperature had not dropped and pus was expected; none found. After no other cause for the temperature was made out, a vaginal examination showed, not a pelvic infection as was feared, but a tightly closed cervix from which the drainage was insufficient, although the daily lochial discharge had seemed satisfactory in amount, and there existed a dilated uterus with retained lochia.

The cervix was dilated manually and considerable thick blood and clots escaped; this was repeated the next day and from then on there was a steady fall of temperature to normal. Primary union in the abdominal wound. Probably the lochiometra was due to the pituitrin used to control the intestinal distention and pulmonary edema.

After a two days' postoperative rise the blood pressure fell gradually to normal. Urine negative for albumin and casts two weeks after operation and on discharge. Uterus not adherent to scar when patient left hospital and involution was good.

DR. BEACH.—I had a case of retained membranes a few years ago in a Cesarean. When we tried to pull out the membranes they held so tightly that they apparently pulled up the whole uterus. Fearing infection we decided not to insert the hand of release them; they were absolutely adherent in the neighborhood of the os. The uterus was filled with blood and there was no discharge of lochia. Vaginal examination revealed the cervix one finger dilated. We punctured with a dressing forceps and with the escape of blood all the trouble ceased. There must have been some former inflammatory condition around the os. We cut the membranes as short as we could and left them within the uterus.

DR. GEORGE L. BRODHEAD, of MANHATTAN, a guest of the Society then read a paper entitled:

THE TREATMENT OF ECLAMPSIA.*

DISCUSSION.

DR. DICKINSON.—Dr. Brodhead's paper is a scholarly and painstaking contribution to the literature of this subject: a masterly summary by a man who shows balance and can see both sides. I have some personal opinions on the conservative side because my work antedated the "furore Cesareana" and partly because of the results of some present-day operations. When the County Hospital Staff was reconstructed in 1894 and I came on duty, there had been a long series of accouchement forcé cases in nephritis and toxemias. We started on a very conservative line and we had a very low mortality. I have made trial of vaginal Cesarean. As a blanket answer it does not give as satisfactory results as conservative methods. The cartilaginous cervix of the sixth month in eclamptics presents a difficult problem in delivery and simple rupture of the membranes sometimes answers it. Yet I think there is an undoubted field for the vaginal Cesarean. There may be a small field for the abdominal Cesarean and this field gets larger in proportion to the skill of the operator. I protest against the widespread Cesarean practice of to-day. (No abdominal Cesarean without consultation is the remedy.)

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* For original article see page 762, Vol. LXXV.

Dr. Polak.—I also wish to thank Dr. Brodhead for bringing before us so clearly a résumé of the treatment of eclampsia. I do not think this subject can be fully considered without again calling attention to the prophylaxis. This has been demonstrated very impressively in our prenatal clinic, where over 3200 women have been attended and watched during their pregnancies, and only two of these women have had eclampsia. These two women were admitted to the hospital as toxic cases and prophylactic methods were continued, but they developed convulsions. By watching the blood pressure and the urine a great deal can be done for the patient, for the signs of an approaching storm are ever present. There is very little to say regarding Dr. Brodhead's conclusions, they seem to me to be absolutely sane. He spoke of veratrum viride. The late Dr. Fern used it here in Brooklyn with excellent results. It is, however, not without danger. I have come to the conclusion that the use of veratrum without records of the blood pressure is dangerous; for I have seen extreme collapse where it was given in minute doses. We cannot tell what proportion of cases are susceptible. Yet in certain instances it can be relied upon to slow down and keep the pulse to below fifty per minute. As to elimination: the hot pack is a disastrous failure; the patients are unconscious they are more or less obstreperous and difficult to handle, they rebel against it and the gain from elimination is lost in the cardiac exertion of the individual. Of late we have used the electric heater and kept the patient at a gentle warmth, with fair results. In Glasgow we saw the hot-water bed used in eclampsia and the statistics were satisfactory, and we were told that all that was said in favor of it was true. Another point is bleeding the patient from the uterus as a blood-letting procedure. I wish to enter a protest against this method. If we take blood from the patient it is better not to take it from the arterial side, but from the vein, where you know what you are taking, and not to allow the exhaustion of the patient by arterial hemorrhage. I also want to take exception to the suggestion of manual dilatation of the cervix. Any one who claims he dilates manually actually tears the cervix. Each year at the college we sacrifice a woman's cervix for the students and dilate a cervix manually. Then we bring down the cervix, demonstrate the tear, at the same time suturing it. My experience and the experience of other men is that manual dilatation is manual tearing. Another point which has been brought out by Fisher of Cincinnati is the injection of a 2 per cent. sterile solution of magnesium sulphate into the vein as a diuretic and diaphoretic. In the last year there has been less surgery and an effort has been to deliver the patient with the least possible trauma. In those cases where the os is dilated, morphine, magnesium sulphate, colonic irrigation and the hot-air heater are preferred. In those cases at the eighth month without dilatation, vaginal Cesarean is indicated. My own experience with abdominal Cesarean in these cases is not great and I am unconvinced that it is the best method for delivering in eclampsia. Dr. Beach has done this several times.

Dr. Beach.—I have formed some very definite conclusions with regard to abdominal Cesarean section in eclampsia, and believe it should be limited to primipara, the unprepared cervix, and done in the first five convulsions. I have performed it in nine cases for eclampsia, all at full term, and have lost two of the nine, about 22 per cent. One case had been neglected and had had twelve or thirteen convulsions when admitted. A mistake was made by the resident surgeon in bleeding soon after operation. This was done five years ago, before the time of blood-pressure examinations. The other woman died from lack of drainage. I showed the specimen here. In this case the blood pressure fell very rapidly during venesection, from 170 to 90. Another case was watched for five days; when the blood pressure was too high she was bled or was given veratrum; we eventually pulled her through.

Dr. Hussey.—I have very little to add. My ideas are chaotic. Some years ago I was blessed with the simple faith and operated early, and in the majority of cases that ended my worries. At the present time I am beset with the desire to emulate the statistics of the men who treat conservatively and my worries increase. I feel strongly, however, that if the patient is delivered quickly after the onset of the convulsions the prognosis is better for her. I have no statistics at the present time to offer. My experience has confirmed me in that belief. I am at present inclined to deliver my cases as early as possible admitting that as yet I have not acquired the skill and experience in conservative treatment.

Dr. Dickinson.—Since the studies of blood pressure began, and particularly since the more recent studies of blood and its toxic contents, has any considerable series of cases been undertaken comparing veratrum, morphine, and the treatment with operative measures? With such a study we could check up the results as we have not been able to do heretofore.

Dr. Gibson.—Another argument against the hot pack, brought out by Tweedy, of the Rotunda, is that the toxins are not excreted by the skin and that sweating tends to increase the concentration of the toxins in the blood.

Dr. Brodhead.—Regarding the series of cases mentiond by Dr. Dickinson, I do not know that any such series has ever been undertaken. Dr. Polak speaks of the dangers of veratrum viride. We have used it in practically all of our cases and I do not recall that any patient went into collapse. I believe it should be given cautiously, with the house surgeon watching the blood pressure. We have tried tinctures of veratrum of various kinds and have given large doses without effect, but the Squibb fluid extract is very reliable, and must be used carefully. The criticism of the hot pack is well taken and a good hot-air bath would be preferable. Regarding bleeding in the third stage, I can seen no objection to taking away 12 to 16 ounces of blood. The patient gets rid of that amount of toxins. The criticism of manual dilatation is well taken also. I believe there are cases in which it can be used successfully; for instance, when the cervix is already dilated three to four fingers; the cervix may be torn, but I think it can be done in the majority of cases without much tearing. Regarding Cesarean sectionI have the statistics at the moment of 131 cases, and the mortality is only 14.5 per cent., and if all the patients had been operated upon early the mortality would probably have been 11 per cent. At the present time no other treatment in selected cases can be compared to abdominal section, but I am speaking to men who are doing these operations right along. I think the future is going to show a lower death rate for mother and child when the operation is done by men of experience.

Dr. R. L. Dickinson gave an illustrated lecture on

THE TREATMENT OF REBELLIOUS TRACHELITIS.

with pictures of the cervix and vagina showing various forms of cervical disease.

DISCUSSION.

Dr. Baldwin.—I agree with all that Dr. Dickinson says regarding the treatment of these cases of trachelitis, and for many years have treated them very much as he describes. As to operations on the cervix during the child-bearing age I believe that such operations should not be performed until women have passed that period, unless there are symptoms not otherwise controlled. Often they do more harm than good. Perhaps I have been more vigorous than Dr. Dickinson. My cautery knife is like a small curet, and I curet the entire cervical canal as clean as possible but do not get down to the submucous tissue. In many of the large eroded cervices I cauterize thoroughly the entire diseased surface. The treatment causes little or no pain.

Dr. Gibson.—Dr. Dickinson's pictures are beautiful, and the paper is timely as we have lately swung more toward the more radical methods of treating these cervices, either by trachelorrhaphy or amputation. It is astonishing what can be accomplished in a very short time with the cautery and every cervix which is inflamed, eroded or congested without a complete tear through the rim in a woman in the child-bearing period should be so treated. In the clinic at the college we are using a cautery tip slightly wider than the one which the Doctor has shown here. We place the tip in the cervix cold and then turn on the current. The advantage of the wider tip is that you do not have to make so many applications as with the loop. Another point is that one should not burn too deeply and must keep away from the scar tissue in the angles.

Dr. W. B. Chase.—I should like to ask Dr. Dickinson regarding the occurrence of malignancy during the prophylactic treatment of some of these cases?

Dr. Dickinson.—The diagnosis is sometimes difficult to make between malignancy, eversion and erosion, but a perfectly simple test is friability. Whenever your curet digs out a hole without pressure, or when pieces of material are loosened readily then you diagnose malignancy and follow up with laboratory examinations. These cautery treatments will roll in the cervix and will bring the lips together and there will no longer exist an inner lining of the canal in contact with the vaginal walls and subject to the irritation of the vaginal secretions.

Meeting of March 2, 1917, *the Vice-president*, DR. R. M. BEACH, *in the Chair.*

DR. VICTOR L. ZIMMERMAN reported a case of

WANDERING SPLEEN WITH TWISTED PEDICLE REMOVED FROM THE TRUE PELVIS.

I present this specimen not that it is of any particular interest pathologically, but from the fact that it was found in a very unusual position. It was removed in the country five days ago, which accounts for the fact that there were no blood studies previous to operation. The patient is fifty years of age, single, has always been well except for severe sacral backaches for the past year. She had an operation for strangulated hernia five years ago. She always has had to work hard. In spite of the fact that she is a virgin, she had a complete procidentia, for the cure of which she sought operation. Examination for the first time under anesthesia, showed her to have a very relaxed abdomen, a small introitus through which protruded a small uterus, the entire bladder, and a large rectocele. On reducing this mass, a large oblong tumor could be felt lying transversely in the pelvis, not as hard as the uterus, yet of more dense consistency than an ovarian cyst. No diagnosis as to the nature of the tumor was possible. The prolapse was treated by a general repair of the anterior and posterior walls of the vagina. The abdomen was then opened and the enlarged and congested spleen was seen firmly wedged in the true pelvis. After removing it from its pelvic bed, and following the pedicle upward, the latter was found to have three complete twists, enough to congest but not to strangulate the organ. The pedicle was about the size of the index-finger, and composed of very large blood-vessels, and peritoneum. There was a thin attachment to the cardiac end of the stomach. The liver extended well over to the left side. The pedicle was tied off, and the spleen removed; so far there have been no untoward symptoms. Evidently, the displaced spleen had forced the uterus and bladder out of the pelvis. The operation was concluded by fixing the fundus to the fascia of the abdominal wall.

DR. MILLS presented a case of

PROBABLE OVARIAN PREGNANCY.

This was a woman, aged thirty, married, Russian, who was admitted to the Kings County Hospital February 14, 1917, her chief complaint on admission being acute abdominal pain. Family and previous history both negative. Began to menstruate at fourteen, always irregular, never early, six to eight weeks late; always had pain during the first 24 hours; last period Jan. 10, 1917. Married at twenty; has had four children; all deliveries easy; states she was never sick more than an hour. No instrumental deliveries. Present illness: Patient states that she menstruated once immediately after weaning her baby three months ago. She next saw a flow on January 10, 1917 when she bled only three days. Following that she states that she felt perfectly well until January 31, when she was seized suddenly with severe cramp-like pains in the pelvis and a feeling of weakness and nausea; states that she vomited and was unable to retain food; pains were recurrent and cramp-like in character. These pains persisted up to the time of her admission to the hospital February 14. Examination showed the abdomen quite distended, no rigidity, generally tender, more especially in both lower quadrants; slight obliteration of liver dulness. Temperature was 99° F., pulse 120, respiration 28. Blood count: hemoglobin 65 per cent. red cells 3,000,000; white cells 59,600; polymorphonuclear 87 per cent. When the abdomen was opened we found the pelvis filled with blood, and the bleeding point was located in the left ovary which was removed. The ovary was sent to the laboratory and the pathologist reports as follows: The specimen consists of an ovary measuring $4 \times 3 \times 1.5$ cm. Situated at one margin is a cavity, irregular in outline and filled with blood clot. It appears to have been a cavity or a structure which has ruptured. On section it involves a portion of the ovary. Just below it a large corpus luteum is seen. Sections of ovary show a considerable suffusion of blood at one margin. Here a delicate reticular arrangement is seen and large cells with deep staining nuclei are also noted. These cells appear to be decidual cells. A large corpus luteum, many ova and an occasional Graafian follicle cyst are also present. Diagnosis: Ovary; apparently showing decidual cells. In my judgment this case is clinically an ovarian ectopic gestation.

Dr. Chase.—Without discussing the case presented by Dr. Mills I wish to bring up a point that is a mooted question, whether it is better to operate on such a case or to let her bleed. We have evidence from good authority that the expectant treatment works out well, but here was a woman with pelvis filled with blood who was operated on and did well. It takes more courage to operate in such a case than not to operate. In deciding the question of operating in a case I would be controlled by my own judgment. It is a point that will never be settled to the satisfaction of everybody.

Dr. Schwartz.—I have seen five cases of ectopic with ruptured corpus luteum, two of them my own cases, and one of them I think I ruptured in the operation, the abdomen was found filled with recent blood. In taking out the ovary nothing was found except the ruptured corpus luteum cyst.

Dr. C. F. Mack (by invitation) reported with a *specimen* a case of

PREGNANCY AT THE SITE OF PREVIOUS INCOMPLETE ABORTION.

This case has many points of interest. It is in my opinion a pregnancy engrafted upon a retained placenta of a previous three months' miscarriage. I was called to see a woman last July who was having a miscarriage and who had passed a fetus about three months development. I asked if the afterbirth had come and the nurse said she thought it had, as a lot of clots had come away; she was sure it had passed. I wanted to keep my fingers out of the patient and I waited three or four days. The hemorrhage stopped and then

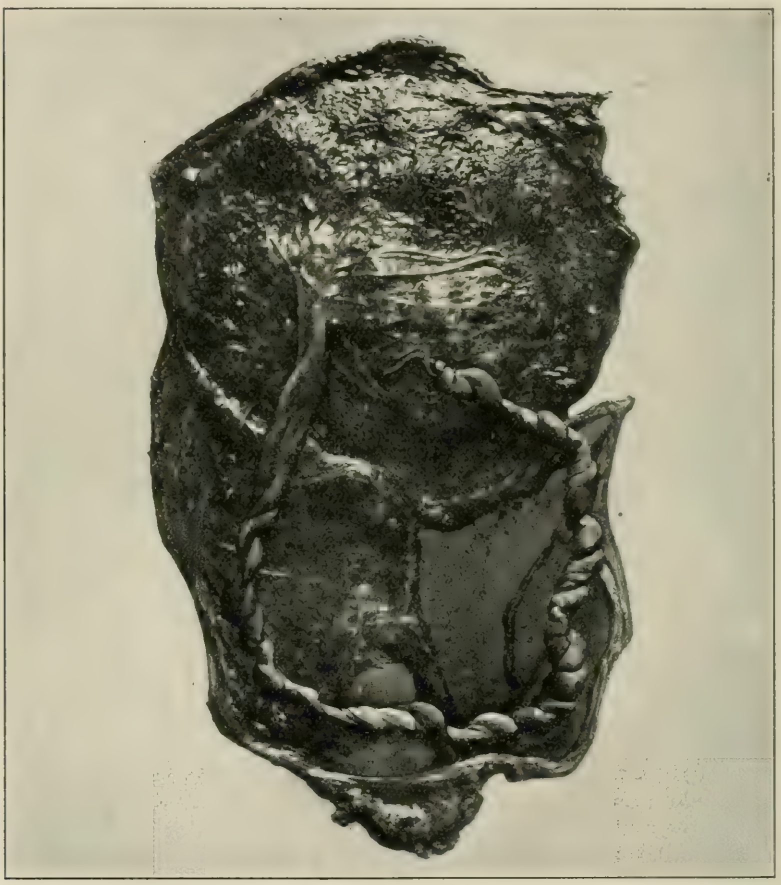

Fig. 1.—Pregnancy apparently engrafted upon a retained placenta from a previous three months miscarriage.

commenced again, and again it stopped and then started again, and I decided that I would go in. Upon examination everything felt smooth, yet the depth of the uterus was not right, but I attributed it to the pregnancy and to the subinvolution, although I was not satisfied. The patient got up in about ten days but complained that there was always a brownish discharge. This continued about one and one-half months and finally ceased. That was in October. In November she menstruated but the flow did not stop in the usual time, there was considerable brownish discharge. I figured that if there was a retained afterbirth it would take care of itself. In December menstruation did not come on; she thought she was pregnant and came for an examination. I could not tell but the uterus was larger than normal, not much changed from the condition of the previous August. In January she had a little discharge which was followed by considerable flow. In February the flow ceased except for the brownish discharge. In February she complained of vomiting and nausea. I went into the uterus and found the depth the same as in the previous examination. I gave her some ergot and told them to send for me if I was needed. That was Thursday. On Monday her mother came over and brought this specimen. I was satisfied it was the original afterbirth and in examining it I found a membrane within which was a four to five weeks development, showing that a new pregnancy had become implanted in the old afterbirth. It is a beautiful specimen with the old afterbirth on one side and the fetus on the other, implanted seemingly on the body of the old placenta.

Dr. Pool.—"Do I understand that the second pregnancy was on top of the first placenta?"

Dr. Mack.—"It is right in the body of the old placenta."

Dr. Beach.—"How would you prove it was implanted on the first placenta—the umbilical cord seems to run to the other side?"

Dr. Mack.—"The placental attachment was evidently to the body of the uterus."

Dr. Pool.—"May I suggest the possibility of a twin pregnancy at the beginning, with the very early arrest of development of one fetus, the other going to about three months, and then being expelled by abortion? Since it is not clearly demonstrated that the remaining fetus has a placenta of its own, but was found in its sac attached to the original placental mass, this seems to be a more reasonable explanation of the matter."

Dr. Mack.—"That seems hardly possible from the length of development of the second fetus. If it occurred at the first pregnancy there would have been a discoloration and absence of the eye. There was a sac about the fetus when I first examined it."

Dr. Leo Schwartz reported a case of

UTERUS SUBSEPTUS WITH DOUBLE CERVIX AND VAGINA. HEMATOCOLPOX, HEMATOMETRA, AND BILATERAL HEMATOSALPINX.

This patient, seventeen years old, single, Norwegian, was admitted to the service of Dr. Polak at the Jewish Hospital, October

8, 1916. Family history: brother suffering from pulmonary tuberculosis. Menses began at thirteen, regular every twenty-eight days, four days' duration. After her arrival in this country eighteen months ago patient had a period of amenorrhea for thirteen months; she then menstruated irregularly; her last period occurred six weeks before admission to the hospital. This flow was rather scanty, accompanied by severe pain in the left lower abdomen, lasting only three days. The pain continued for about two weeks, during which time she had frequent and painful urination. Six days ago the patient had another attack of excruciating pain in the left lower abdomen, felt nauseated but did not vomit, had no chills or fever. Examination showed a well-developed female, looking acutely ill; increased resonance and harsh breathing at the apex of her lungs; heart negative. Abdomen revealed a smooth, soft tumor, palpable above the pubis, extending more to the left iliac fossa. Vaginal examination revealed a normal virgin uterus, very deep and admitting one finger. The vaginal vault was followed out. To the left of the introitus could be felt a bulging soft mass, protruding at the vulva and displacing the vaginal vault downward and to the right. Before proceeding with the vaginal operation, the abdomen was opened in the median line above the pubis. The uterus was enlarged to the size of a four months' pregnancy and of a cystic consistency; the left tube in its inner half was distended, the right tube also distended only for about one-third of its length and smaller. Both ovaries appeared large, white, hyperplastic. There was no free blood in the pelvic cavity. Having confirmed the diagnosis an assistant proceeded with the vaginal operation. The vulvar prominence was punctured and a large size soft rubber catheter immediately inserted. There was an escape of dark fluid blood. The abdomen being still open, the uterus was observed to diminish in size. When the uterus had diminished to about a four weeks' pregnancy the tubes were noticed to diminish in size. A distinct cleft could now be felt in the uterus, also two faint crevices. The abdomen was now closed in layers and the catheter stitched to the vulva. Postoperative course: For the first twenty-four hours the patient's pulse rose to 140, but under morphine it soon came down to 100. The catheter was expelled on the second day. The further course was uneventful. Second operation: Fourteen days after the first operation the patient was again taken to the operating room and examined under anesthesia with the following findings: double vagina, with thick, fibrous septum. The septum was clamped with two long clamps and divided with the cautery. Smears obtained from urethra and vagina showed the presence of gonococci. Urine negative. Blood count: white cells, 14,300, polynuclears 82 per cent. On discharge: Primary union of the abdominal wound; one vagina with the remains of septum present; two cervices, one anteriorly and to the right and the other posteriorly and to the left; uterus anteverted, freely movable; tubes normal size; ovaries enlarged. Follow-up record: Patient seen in January, 1917, menstruated twice since operation without any discomfort.

Dr. Polak.—There may be some question as to the advisability of opening the abdomen in these cases. I want to call attention to the fact that Amand who has probably seen and reported more of these cases than any other man in Europe, believes that it is important to inspect the abdomen in order to see if there has been hemorrhage from the tubes. In all of his cases—he has an experience of fifty, of which I saw him operate on two—he states that the inspection of the abdomen should be the routine. In some of the reports, where merely puncture has been done, the patients have died from peritonitis. Dr. Skene, many years ago, called attention to the importance of puncturing the imperforate hymen with the cautery, rather than incising it. I saw a woman in whom it was opened with a knife and flushed, who became extremely septic. We have opened the abdomen in these cases to see if the conditions are favorable and then while the inspection is being made, the puncture with the cautery is done, and a tube inserted a week or so after the hymen is excised.

Dr. Shoop.—Why is the catheter used in these cases?

Dr. Humpstone.—Why is the abdomen opened?

Dr. Polak.—To see if it is necessary to drain the abdomen as well as the vaginal sac.

Dr. Schwartz.—In a previous case I had of hematocolpox I simply incised the introitus and drained and the patient ran a severe course and complained of pain. I read an article advising this method and decided to drain the abdomen in the next case, which I did."

Dr. William Pfeiffer read a paper on

SOME CAUSES OF FETAL DEATH.*

DISCUSSION.

Dr. Pomeroy.—I suppose since Dr. Pfeiffer has taken my name in vain in referring to a method of managing posterior occipital positions and since he has not described that maneuver I feel that I ought to enlighten anyone who does not know the same. In the analysis of the causes of fetal deaths and in trying to make a statistical paper all embracing of the subject one finds that the material is almost inexhaustable. I have never been able to teach myself how to handle such cases except when I encountered the disaster, and then only in that particular case. There are so many causes of dystocia that an analysis of the individual case is a most interesting detective enterprise. The general devitalization of the fetus from long pressure, intermittent or almost constant, makes it difficult for the baby to withstand the strain of the delivery. That is one factor; we must consider the actual trauma. For instance, it should be thoroughly understood that the commonest cause of disaster is that the tips of the forceps impinge on the temporal bones. It is almost impossible to get the Scanzoni maneuver without such a result, and the baby which has been pressed severely before the delivery will not stand much more. An autopsy would show a clot of blood on the brain. My own conclusion is that many of the posterior positions of the occiput resulting in secondary inertia which to me means spastic retraction of the uterus, causes a cessation of progress; the uterus has exhausted itself by opening and shutting without extrusion, and we are reduced to the situation where the child must be extracted. It goes without saying that if the child had not been allowed to go so long in the position and the indications had been studied carefully the change from the posterior to the anterior occipital position might have been done earlier. I have been trying to settle some point of distinction whereby we may decide that a given posterior case may take care of itself or that it may come to a standstill. My own rule is that when a patient has been in labor for twelve hours and one cannot see that the termination is inevitable within the next three or four hours, the question of rotating from posterior to anterior position must be at least considered. If it is determined that the procedure must be done the cervix must be dilated or made dilatable by the hand, that such a dilatation will not result in a laceration. The patient must be under surgical anesthesia at least five minutes. The hand is inserted and grasps the shoulder of the child and the body of the child is rotated so that the position is changed 180°. If it has been a R.O.P. it must be changed to a L.O.A., or *vice versa*. In the execution of the maneuver a certain technic must be developed and the hand used that is most convenient. That is if the position is a R.O.P. the right hand must be used, if L.O.P. the left hand must be inserted within the uterus. The patient must be completely under an anesthetic, the membranes ruptured or not, and after the rotation has been accomplished we proceed with the delivery by forceps or not depending on the degree of exhaustion of the patient and the reasonable probability that she can continue with the labor. It is better to try this maneuver before the patient has used up her strength, for if the case is allowed to go on and the head has become molded, there is more risk that at some stage you will make pressure on the temporal bone. The point is in executing this maneuver that you must rotate 180°, not 90°. It is perfectly ridiculous how simple this method is when it is compared with some attempts at version. There is no possible condition where it can be as difficult or as likely to fail and cause rupture of the uterus as another maneuver which we might undertake. I note what Dr. Pfeiffer states as to placental bacteremia; it is possibly not intended that the baby shall be sterile.

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*For original article see page 74.

Dr. Bishop referred to recent papers by DeForest and others about the possibility of women becoming infected by the bacillus of Bang from contact with cows, that had contagious abortion. Also that the statistics of Dr. Williams of Baltimore that 44 per cent. of such cases of distocia were due to deformed outlets were somewhat exaggerated. Another point was the factor of coitus as a possibility of infection. Dr. Bishop asked Dr. Polak what was taught in the College regarding the limitation of coitus.

Dr. Polak stated that they taught that coitus must not be allowed after the eighth month or during time that menstruation would have appeared except for the pregnancy.

Dr. O. P. Humpstone then read a paper entitled

THE INCIDENCE OF A CASE OF ERYSIPELAS AND ITS SEQUELÆ.

DISCUSSION.

Dr. John O. Polak.—The doctor's conclusions are most interesting to me. For six years we have not isolated our puerperal sepsis cases and in that time we have not had a second case develop. Concluding that these infections came through the bedpan can hardly be accepted, when it is evident that a nurse must have been the common carrier. I can readily see how the bedpan could be a focus of infection in a careless nurse's hands, but as bacteria do not walk it is difficult to conceive how the erysipelas coccus was transferred from the bedpan to the obstetric wound without a careless hand. Some time ago I reported before this Society that the vulvar pad was a direct source of colon bacillic infection in perineal operations and we have found that since we have discontinued the use of the pad our perineal results are better. It is difficult to see notwithstanding the graphic description which the doctor has given, how the bedpan alone carried the infection; since infectious bacteria are more or less constantly present in the vaginal tract, they do little harm and those about the vulva are likewise inactive unless carried into the wound by nurse, physician or instrument.

Dr. Pomeroy.—I want to emphasize what Dr. Polak has said. While we are carried away with the picturesqueness of the report I am not convinced that the common factors in that situation were of the type of streptococcus that are the cause of our puerperal sepsis. Clinically we are dealing with a certain type of illness, not a single instance of hematic infection. I am not prepared to admit that the common carrier in such cases of puerperal infection, the common factor, is the dressing nurse, not criminally negligent, but in the old days when douches were used, we had undoubtedly infection. But where we have abandoned the use of perineal dressings in wounded conditions and abandoned douches we never had such an experience as this. I am still at a loss to see how it had any bearing on the puerperal state at all. If this epidemic had broken out in a woman's ward where a nurse was doing dressings from patient to patient, in medical cases might it not have broken out just the same.

Dr. Pool.—A short time ago I had occasion to look up some statistics regarding the presence of disease organisms in the pelvic passages of puerperal women, and was quite astonished to find a statement by Lea, that in the examination of a series of pregnant women he had discovered hemolitic streptococci at the vulvar orifice and in the cervix in 20 per cent. These women passed through the lying-in and puerperium without evidences of infection. There can be no doubt that these organisms are always with us, and also that they vary greatly in their virulence. The patient does not develop bacteremia, of necessity, when she becomes infected. Many of even the severer forms of streptococcic invasion remain local unless disturbed. Dr. Humpstone is to be congratulated upon his fortunate escape from an awkward situation.

Dr. Bishop.—The important situation here, aside from the dramatic clinical picture, is the very practical one of an administrative problem. This went through one ward. How was isolation carried out? Were separate nurses, ward maids and internes assigned to that ward only? Where were the points of contact with other patients and how were they broken are the essential questions?

Dr. Chase.—As to the virulence of infections. I had some experience in early days in the country in treating erysipelas, and I never saw or heard of a case of puerperal sepsis from such a source. In the country districts the germs do not appear to be so virulent, but in the cities it is different. I think the germs which we find in the country places and the cities are so diverse that one is harmless and the other poisonous.

Dr. Beach.—I should like to ask Dr. Humpstone whether all of the cases developed temperature simultaneously, after the infected bedpan was discovered?

Dr. Humpstone.—I feel honored that so simple a matter should call forth such an amount of discussion. I knew the brilliant minds in this Society would pull my paper to pieces. In such a condition the common carrier is the nurse, and the bedpan the instrument, and the bedpan sterilizer is going to do away with all the trouble. With regard to the infectiousness of the disease nobody knows why it is but the erysipelatous streptococcus is virulent in a puerperal woman; it has been known for years. The hemolytic streptococcus is a germ that travels by the lymphatic passages; it hemolyses the blood. As regards the time of the infection one woman developed fever on the twenty-second, the next on the twenty-third, another on the twenty-second, another on the twenty-seventh, the next on the twenty-fifth. The strongest argument against the assertion that Dr. Oliver Wendell Holmes made regarding the infection of puerperal fever was that it was not so in the country districts and Americans would not admit the truth of the statement. It was in England that Semmelweis proved the truth by isolation of the cases.

Meeting of April 6, 1917.

The President, DR. CLARENCE R. HYDE, M. D., *in the Chair.*

DR. J. O. POLAK reported a case of

TOXEMIA OF PREGNANCY SIMULATING ACUTE YELLOW ATROPHY OF THE LIVER.

I desire to report a case of toxemia of pregnancy in the eighth month which came under observation at the Long Island College Hospital recently. On admission the patient gave a history of having vomited for four weeks almost continuously everything that had been taken into the stomach. She had a pulse of 150 and looked extremely sick. There was no sound of a fetal heart. She also showed a condition of the skin indicating biliary injection, which has given rise to the fear in these cases of the presence of acute yellow atrophy of the liver. The urine contained acetone, diacetic acid, tyrosin and leucin with albumin and casts. She was so sick that we felt delivery even if the child were dead was out of the question. We used intravenous injections of bicarbonate of soda in 2 per cent. solution and there was some improvement in the pulse but no improvement in the urine. We then used a 2 per cent. solution of glucose, and almost immediately the patient seemed to improve. This was repeated until the pulse was brought down to 120 when labor was induced and she delivered herself of a dead and partly macerated fetus. From the time of the injection of the glucose to the delivery was ninety-six hours. Improvement continued after the delivery of the baby. Notwithstanding the evidence of hepatic changes these cleared up completely and when she left there was no indications of the supposed acute yellow atrophy or that it had done any damage. I am reasonably sure she did not have acute yellow atrophy.

DR. ROBERTSON.—I had a similar case in private practice where there was pernicious vomiting in the earlier period of pregnancy. The urine revealed similar conditions but leucin and tyrosin were not present; possibly had the urine been examined more closely they might have been found. This woman responded to similar treatment with this exception that the glucose and bicarbonate of soda were not given intravenously, but by injection. This patient was in grave danger and the delivery was considered, but she recovered and carried a living child. Both cases show the necessity for an examination for more than urea and albumin, and that there should be a greater refinement of analysis than that ordinarily made. Yellow atrophy might have been present in my case but we did not go into it far enough to reach a conclusion.

DR. JAMES P. GLINN read a paper entitled

SOME GYNECOLOGICAL WEAKNESSES.

Under a system of awarding or assigning the preparation of a paper, such as obtains in this Society, the assignee is forced into one of several paths.

If he be bursting with an original thought—so rare—or has evolved a novel procedure—not so rare—he eagerly welcomes the opportunity to deliver his message.

Granting that the idea or procedure be truly new, it commands at least attention.

But newness or originality alone does not confer merit on a scientific production, unless it be of value in forwarding the progress of science. So that the most valuable paper is the one that combines novelty with merit.

The second course which seems to tempt the prospective author of an awarded paper must be mentioned only to be discarded.

It results in what may be called the near-original paper, the product of an effort to be original for the sake of originality.

The result is usually recognizable as some old friend in new habiliments. Witness the daily perpetration of new operations on the perineum or the thinly disguised hyphenated attacks on the round ligaments. Still another avenue of expression that beckons the sometimes reluctant parent of the requested scientific idea is the summary or digest.

The writer, electing this method, buries himself in a medical library, and there browses in the pleasant pastures of other men's thoughts. It is a very laborious business at times, entailing most patient research, and painstaking consultation of references, etc.

The result of this culling process is not to be despised. It is very helpful to the large number of workers who either have not time or have not industry sufficient to keep pace with the advanced things of their special field.

Lastly comes the refuge of the less energetic—the path of criticism. It is destructive perhaps, but in its defense it may be said that attack leads to defense, and defense stimulates effort to repair defects.

The writer has selected for his points of attack three weaknesses of gynecological surgery, namely, our attitude toward *pain;* the treatment of the sagging uterus and bladder; and the means we employ against sepsis.

Our method of dealing with pain shows our short-comings perhaps as well as anything else, whether we are facing a problem of constant pelvic pain or of a dysmenorrhea.

There are many varieties of the class that consults the gynecologist for pain, but we all know the type of women that comes nervously into our consulting rooms, talkative, anxious, having been the rounds of other surgeons, complaining of a number of things, but chiefly of abdominal pain, sometimes localized, more often shifting, perhaps constant, may be intermittent.

The pain is characterized by adjectives varying according to the temperament and the vocabulary of the applicant for relief. We listen patiently to a more or less helpful history, and then proceed to the physical examination. We find something—yes, we always find something—that appears to explain the pain. Is it an ovary, somewhat enlarged, probably cystic, prolapsed a little as well? Is it a uterus lacerated at its lower pole, or deviated or flexed as to its body?

It matters not—operation is suggested, and acquiesced in. The ovary is blithely removed, or conservatively resected, the repair is made in classical style, the restoration of posture or angle is effected by an up-to-date method, and the result is excellent—anatomically. The patient leaves the hospital happy and looking forward to brighter days. Next month, or the month after, that face darkens our doors again. Bright hopes blasted—pain as bad or worse than ever. The whole affair has been a failure. Another enemy made, and worse—another blow dealt to good surgery. Why? Because the examiner's mind has been fixed on the pelvic organs, and he has closed his eyes to the more obvious. He has overlooked the factor of constipation. He has forgotten the possibility of visceral ptoses. He didn't note the prolapsed kidney, or the sagging colon. But most frequently he has ascribed an organic origin to a condition that is purely psychical, and has ignored the well-established entity of the hyperalgesia of hysteria so commonly localized by the neurologists over the ovary, the most common of all the hysterogenous zones. The pains of drug addiction, too, may profitably be remembered. Perhaps the most marked of gynecological weaknesses is exhibited in our efforts to restore the prolapsed uterus and bladder—a field of endeavor easily the most active in gynecological surgery. The very multiplicity of procedures in vogue, like the number of remedies for rheumatism, attests to the fact that no one is effective. If you will bear with me I will recite the tedious list of the procedures most in vogue to-day for the relief of this condition of descent of the uterus and bladder.

Procedures Where Future Pregnancies are Eliminated:

Vaginal Operations: 1. Interposition operation. 2. Vaginal fixation. 3. Vaginal hysterectomy, high or low fixation of stump. 4. Partial vaginal hysterectomy. 5. Colpocleisis—or closure of vagina.

Abdominal Operations: 1. Ventrofixation. 2. Implantation of uterus. 3. Supravaginal hysterectomy. 4. Complete Hysterectomy. 5. Ventral fixation of old vaginal stump.

Function of pregnancy preserved.

Abdominal Operations: 1. Anterior lfastening of fundus, by one of round ligament operations. 2. Plicating of broad ligaments anteriorly or posteriorly. 3. Shortening of uterosacral ligaments. 4. Repair of uteropubic fascial plane from above.

Vaginal Operations: 1. Anterior fixation of fundus by one of vaginal round ligament operations. 2. Shortening of broad ligaments. 3. Shortening of uterosacral ligaments. 4. Repair of pelvic floor. 5. Plication of vagina. 6. Amputation of cervix uteri.

It would be far too arduous a task to detail the defects or weaknesses of each of these procedures. Suffice it to say that it is the writer's conviction, after a fairly wide experience personally, and in observation of the work of others that most of these operations disappoint, either because they do not accomplish permanent restoration, or if they do, it is at the expense of pain, that is a worse affliction than the condition sought to be relieved?

Finally it seems to me that our attitude toward sepsis—postpartum—postabortive or postoperative is a weak one. Our efforts to deal with this condition are discouraging. In what way do they differ radically from those of twenty years ago? Most importantly to be sure is that we have learned to interfere less. But that is a negative gain. Otherwise the treatment is as the ancients used to say—expectant and supportive. It's true there are the sera and vaccines, but is it not equally true that enthusiasm for these is on the wane? In this connection it is interesting to note that one of our fellows recently reminded the writer of the possible value of blood transfusion in case of sepsis, accompanied by blood depletion from hemorrhage.

The writer has already conceded, by inference, that disparagement is easier, cheaper if you will, than construction of something better, and he admits that he has not established a complete case in his indictment of the shortcomings of the gynecologist's art, but if his suggestion that all is not as perfect and as sure as some of our literature would lead us to believe, will save some one from an unwarranted enthusiasm, or better still, will stimulate effort for the advancement of our science, then will he be truly rewarded for exposing himself to the charge of pessimism.

DISCUSSION.

Dr. Polak.—Dr. McGlinn has brought home to us some facts that have appealed to me for a number of years. At the Long Island College Hospital as it is at other hospitals the number of cases that are left to us from other services give us trouble. It is interesting since we have followed out the plan of the last few years of having every case worked out to a finish to see how many different causes there are for pain. It is very trying where we have taken out an ovary and missed the cause of trouble in the sacroiliac joint or when we have taken out an appendix and then found that the trouble was in the cecum. So I think the whole matter comes down to the fact that we are defective in our diagnosis because we sometimes lose sight of the fact that we are dealing with a woman with organs besides the ovaries and vagina. I have now a woman under my care from Port Jervis who has had five operations, and that patient has all the pain she started with, and she has a palpable lesion of the gallbladder. She has had a kidney fixed, pelvic floor done, and all by a very excellent operator, but he failed to recognize the cause of her backache. We operate on this patient tomorrow. These patients have a right to a careful diagnosis before surgery is instituted. Regarding prolapse I am willing to admit I do not know how to cure prolapse. Cases come to us that have been cured by other operators and cases that have been cured by us go to other hospitals for cure. Regarding sepsis I must take exception. We are far in advance of a few years ago. Sepsis is now a definite pathological entity and where there are a series of definite lesions there is a definite pathology. We have all come to the conclusion that all cases that have a definite pathology are cured by the patients, resistance, but we have gone far ahead in the diagnosis of the pathology of the conditions.

Dr. Hyde.—Since we have adopted the system of careful diagnosis of cases in our service no case has been operated upon until there has been a complete study and complete pathological report, and oftentimes before a patient is operated upon more than one man sees the case and reports upon it, and we operate only for one distinct object. Cases are not discharged after operation until the patient has been seen and criticised by others of the service. I think that fact has made us more careful; we do not want to operate on a case and have our work criticised adversely afterward.

Dr. McGlinn asked if cases are examined after a long interval.

Dr. Hyde.—The examination is made at the time of discharge. Dr. Pool or Dr. Polak examines cases operated upon by me and Dr. Gibson or I examine cases operated upon by the other surgeons. The chart gives the length of time of operation, findings at operation, also the findings both before and after operation and at discharge. We are all stimulated to do better work. We train the residents and assistants to-day to know how to make diagnoses. Each patient is given a card and is sent back to the dispensary to the original man who first saw the patient, and follow up work is for the purpose of noting the conditions that develop later. The cases that go out often will show entirely different conditions three months later.

Dr. Holden.—I have been interested in what Dr. McGlinn says about not getting results anticipated. I think the time has gone by when a man sees a case in the afternoon and operates next morning. During one of my visits to New York recently I saw a surgeon operate on a patient and before commencing he remarked: "I have not examined this patient before." He was operating on the house surgeon's diagnosis. I think that is going to be considered later as a crime. How many times we find a patient presenting a picture, and yet after that patient has been relaxed and cleaned up another examination shows different findings. With the first findings an operation would be without result. A point not brought out by Dr. McGlinn is that we do not give sufficient time to preoperative study of the patient's previous life. A woman who is right from the wash tub is in the class with the woman who has spent her time playing bridge, when they are both placed on the operating table. Time spent in the preoperative test and examination of the patient is more than offset by the time lost and the patient will do better. We have followed this plan and we have gone one and one-half years without a fatality, and it is due to the care we have taken in this regard.

DR. VICTOR A. ROBERTSON discussed

"PREGNANCY COMPLICATING FIBROIDS,"

and reported the following cases.

CASE I.—Mrs. F., primipara, referred by Dr. Dudley, was seen by the writer four years ago. She was younger than the majority of cases with this complication, being under thirty. A large mass was found on palpation on right side of abdomen. This mass was fused to the uterus which was also enlarged apparently by other growths. This patient had been married several years, but was not suspicious of pregnancy as irregular hemorrhages were present, and no signs of conception had appeared. A laparotomy revealed two masses springing from fundus of uterus, one about the size of a child's head—weighing after removal 5 pounds, the other the size of an orange. She was also found to be pregnant. It was possible to remove both of these masses without unduly disturbing the gravid uterus which contained a three months' fetus. Although miscarriage was expected, the patient went to full term, with a normal delivery and a living child.

CASE II.—Mrs. L., aged thirty-seven, married fourteen years, one child thirteen years before, one miscarriage ten years ago. Menstruation regular, but always profuse and painful. Unwell January 5th for the last time. On February 20th had sharp pain on the left side of the abdomen, hemorrhage and fever. She was sent to the hospital for treatment with a diagnosis of ruptured ectopic. A diagnosis of uterine fibroids undergoing septic changes was made after careful examination. Pregnancy was suspected, but the uterus could not be differentiated from the tumor masses. One was found occupying the left side of the pelvis and extending upward toward the left flank. The other mass was situated posteriorly, and was intrapelvic.

Operation was at first refused, as after the patient had remained in bed for a few days, the pain and hemorrhage disappeared. The patient had never noticed a mass in abdomen. Operation March 13, supravaginal hysterectomy. The uterus was found enveloped by tumor masses and containing a two months' fetus. The operation was complicated by intestinal adhesions to tumor masses which after some difficulty were dissected off. The writer considered the advisability of leaving one ovary, but as both seemed enlarged and macroscopically cystic, both were removed, especially as the patient was thirty-seven, and the physiological menopause was only anticipated by a few years. Recovery was uneventful, abdominal sutures removed the tenth day, patient out of bed on the twelfth day.

DISCUSSION.

DR. HOLDEN.—When the fibroids are smooth it is a very doubtful problem. I saw one a few months ago which I thought was a four months' pregnancy, and yet it was diagnosed as a fibroid. When the uterus was opened we took out a fibroid as smooth as could be. There was a case at the Long Island a short time ago which I saw in the examining room which had all the marks of pregnancy. I asked as to pregnancy. She was young, married, and the uterus was soft in spots. I told the professor I thought it was pregnancy. He said he thought it was fibroid. He examined again and made up his mind it was pregnancy. You cannot tell.

Dr. Polak.—The case mentioned by Dr. Holden was interesting. She was a girl who came into the hospital for sterility and had amenorrhea. My first impression was that the condition was fibroid as Dr. Robertson shows in his case. We examined and reexamined and then opened her and had the tumor out of the abdomen, and yet we came to the conclusion it was pregnancy, and put it back. There was a soft area, distinctly fluctuating, with amenorrhea, changed color, every classical symptom. I did a hysterotomy on that patient two years afterward and found a firm fibroid. A large number of these cases are operated upon before they should be; they can go a long time, as was the case with Dr. Beck's colored woman, the one where the tumor became incarcerated in the pelvis. Let them go along as far as possible and then do a section. The great question in these cases is what to do with the ovaries when you have taken out a fibroid. She was a rather pretty young woman, about thirty and the doctor left in one tube and ovary, as is our practice. We succeeded in getting her back for examination and she shows a size of about five months' pregnancy; the retained ovary has developed into an ovarian cyst. Many of these cases will take care of themselves and as they develop they pull the tumor out of the pelvis and will deliver themselves. The question of induction of premature labor in the presence of fibroid is always a difficult problem, and I want to repeat that there is no more dangerous procedure. These fibroids distort the course of the uterine canal, you get bad drainage, they involute poorly and there are a large number of cases of embolism where fibroids are present. There is no condition so frequently occurring as the red hepatization form of degeneration of the fibroid during pregnancy. The woman should be watched for sudden pain. Suddenness of pain with rise of temperature indicate trouble. Myomectomy can be done without disturbing the pregnancy, but it should not be done until after the third month because of the influence of the corpus luteum in these cases.

Dr. Hyde.—I must endorse the opinion as to the danger of inducing premature labor when there are uterine fibroids present.

Dr. Robertson.—I must confess I did not suspect pregnancy in my first case but I was glad I removed the tumor mass. In the second case there was no question as to the proper procedure, the small uterus could not be removed from the mass. The question of leaving in an ovary was decided by her age, she was thirty-seven years old, and I felt justified in doing a panhysterectomy.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Stated Meeting, Held March 27, 1917.

DR. GEORGE W. KOSMAK, *in the Chair.*

DR. T. H. CHERRY presented an instrument.

FOR MAKING INTERNAL PELVIC MEASUREMENTS THROUGH THE RECTUM.

The employment of rectal examination during labor by obstetricians to ascertain the degree of cervical dilatation and the progress of the presenting part, has of recent years become most popular. There are many reasons why this method of examination should be in general use. Chief among these is the fact that the genital canal is not contaminated by the examining fingers of the accoucheur, which is something to cause his mind to rest at ease if a patient runs a temperature during the puerperium, he knowing full well that he has not been the means of introducing bacteria therein. The simplicity of examination is another factor to be taken into consideration. No attempt at sterilization of the genitals is necessary in making this rectal examination; neither is it important to have sterile gloves for this purpose, an ordinary clean glove being sufficient. Furthermore, the hands of the obstetrician can be saved a considerable amount of trauma by the fact that it is not necessary for him to scrub his hands. Any number of examinations can be made upon the patient with impunity in a prolonged case of labor without fear of contamination, and without the usual energy expended each time in preparation for a vaginal examination.

However, in cases that are seen in labor for the first time, and upon whom no preliminary examinations have been made or mensuration done upon the pelvis during pregnancy, it has come to the notice of the writer that it is not an easy matter to ascertain the fact that a pelvis is contracted or normal by the use of rectal examinations alone. This fact was brought to the writer's attention several months ago where two patients were allowed to proceed in labor by the resident obstetrician in a maternity service without recognizing that the pelvis was contracted. In both of these cases Cesarean section was done after a considerable delay, and at a time when the patients were exhausted by their efforts to deliver themselves of 9-pound babies through an internal conjugate of 7 cm. in the first instance and 8 cm. in the second. This experience led the writer to attempt to devise some method or instrument by which the internal pelvic measurements could be estimated through the rectum. It had been his observation that when making a rectal examination if the promontory of the sacrum is reached with difficulty, or not palpated, the internal conjugate is in all probability of sufficient length for the passage of an average sized fetus.

The instrument consists of a straight bar, 13 cm. in length with a rounded tip and graduated in centimeters. An upright bar, 4.5 cm. in length meets the first bar at right angles, and is attached to it by a sliding device that permits it to be arrested at any point on the first bar and there can be made fast by a set-screw.

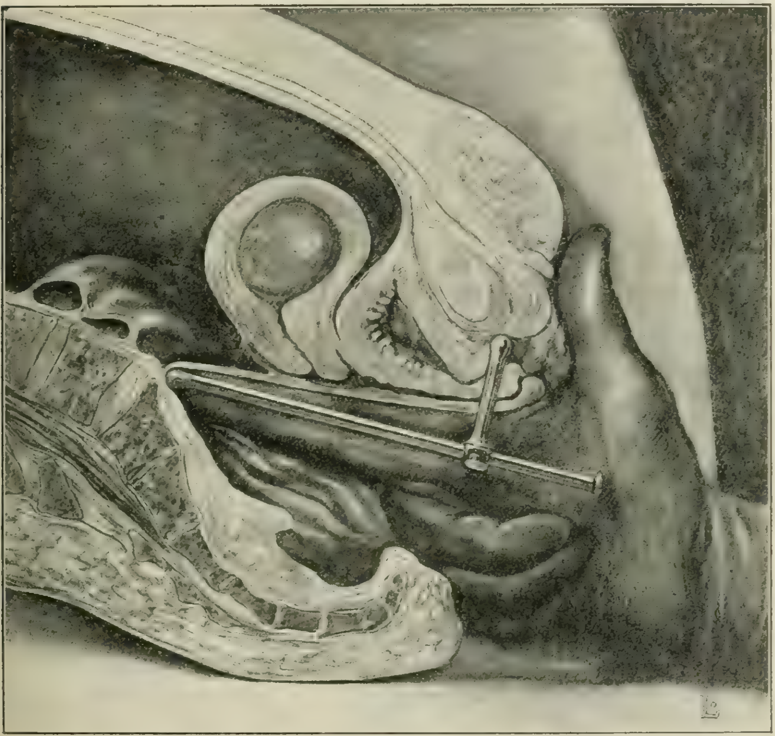

FIG. I.

The first long bar is inserted into the rectum along the side of the index-finger and placed on the promontory of the sacrum. The sliding bar is then moved so the tip can be easily placed under the symphysis pubis, and when this is accomplished the set-screw tightens the same and the distance can be read on the scale. This distance is the diagonal conjugate and is readily ascertained by measuring the distance between the tips of the upright and horizontal bars with an ordinary pelvimeter. From the diagonal conjugate it is easy to estimate the true conjugate by subtracting 1.5 cm. or 2 cm. To facilitate obtaining the diagonal conjugate with this instrument there has already been measured upon the upper surface of the horizontal bar the hypotenuse of each triangle at each centimeter mark, so all that is necessary after the two fixed points of the promontory on symphysis have been obtained is to read the result upon the scale.

Dr. John W. Warren reported a case of

HEMORRHAGIC ABDOMINAL SINUS.

Abdominal sinuses from which any large amount of blood appears with a degree of regularity seem to be very rare. The case here reported is unique and we have been unable to find an account of one of similar character. It serves also to teach a lesson in the surgery of the Fallopian tubes.

Mrs. K. M., aged twenty, has been married sixteen months, during which time no pregnancies occurred. Her menstruations have always been regular, without pain, lasting four days and of normal amount. She was perfectly well until six months ago when she developed severe abdominal pain with fever, chills and vomiting. An operation was performed consisting of a left salpingo-oophorectomy, a right partial salpingectomy and some form of ventral suspension. Both tubes contained pus. About 3 cm. of the right tube were left in order to give the patient a chance for subsequent pregnancy. The wound was drained by rubber tubes and packing for about six weeks, but more effective drainage was finally necessary. During her stay in the hospital blood was observed on the dressings at the time of menstruation. The patient was discharged with a small sinus on the right side about 4 cm. from the midline. At each menstruation following there was a moderate discharge of blood from the sinus.

On examination the uterus was found very free and movable in view of the very extensive inflammatory process of recent date. The left fornix was free except for some degree of resistance and on the right side the ovary could be palpated. A small quantity of argyrol injected into the sinus soon appeared at the external os. A sound in the uterus and a probe in the os could be approximated, but no metallic click was obtained. Diagnosis was made of a sinus leading to the uterine cavity and operation was advised. This consisted in dissecting out the sinus tract which was presumed to be of the ordinary chronic inflammatory character. It was found, however, that the tract was largely composed of the stump of the tube, and of course communicated directly with the cavity of the uterus. The remains of the tube, with its insertion into the corpus, was excised and the sinus closed in a few days.

In a search of the literature no other similar case was found. The most extensive collection of cases of hemorrhagic abdominal sinuses is given by Lebasteur. He reports a case of ovary and one of tube, both in hernial sacs, where for a time, some flow was noted at the occurrence of menstruation. He does not state whether his case was one of partial salpingectomy—in which event it would be similar to the one here reported. He reports two cases of oophorectomy in which there was an extraperitoneal fixation of the pedicle in which oozing was seen at menstruation. This would undoubtedly be merely the result of general pelvic congestion and not of uterine origin.

It is manifestly fair and right to leave a portion of healthy tube when possible and thereby be able to assure the patient that she has at least a chance of becoming pregnant. We have never seen an intraperitoneal infection follow such procedure, but where one unfortunately comes upon acutely infected tubes, distended with pus, if they are to be removed at all, it would seem wiser to completely excise them together with a wedge from the horn of the uterus.

DISCUSSION.

Dr. Meyer Rabinovitz said: "Dr. Warner's case presents an unusual physiological fact. For if the discharge from the abdominal sinus was bloody, and its occurrence was simultaneous with the menstrual period, then we ought to conclude that there was a reverse flow from the uterus into this sinus, which at operation proved to be the proximal portion of the Fallopian tube. An occurrence of this nature is contrary to physiological laws, and this case ought rather to be regarded as one of those anomalous conditions where a bloody transudation does take place in the Fallopian tube during menstruation."

Dr. Michele Caturani said: "I have had two cases that bled through sinuses in which the bleeding occurred at the time of menstruation. We may have bleeding through the sinuses due to general pelvic congestion occurring at this particular time."

Dr. Warner said: "We could not prove that the blood coming through the sinus was menstrual blood, but the blood only appeared at the time of menstruation. It might have been due to pelvic congestion. What I think is of prime importance in connection with this case is that one prefers to leave a piece of the tube where it is safe to do so, but in this case it was a mistake to leave the tube. Where the blood came from I cannot say."

Dr. Michele Caturani reported a case of

ABDOMINAL PREGNANCY, REMOVAL OF SAC ONE YEAR AFTER SPURIOUS LABOR.

The patient was thirty-three years of age. Menstruation began at the age of thirteen years and had been regular in type. She had been married thirteen years. Her last child was eight years old.

She had her last regular period September 9, 1913, and subsequently developed all the symptoms of a normal pregnancy. She never had any irregular bleeding, and never suffered any considerable pain.

July 2, 1914, she was taken with abdominal pain. Supposing labor had set in a midwife was called. The pains, at times very violent, lasted four days and were accompanied by severe vomiting and fainting spells. During this time the patient was treated with hot abdominal packings and warm baths. At last with the appearance of genital bleeding the pains subsided and everything returned to normal within a few days.

The menstrual periods returned with regularity and nothing worried the patient except the persistent though gradually diminishing enlargement of the abdomen.

In July, 1915, the patient again missed the menstrual period. She at this time consulted the writer. He found a large cystic, but tense, mass on the left side of the pelvis and abdomen, well above the umbilicus, closely connected with the uterus, but entirely distinct from it. The uterus showed early signs of pregnancy.

I did not pay much attention to the previous history, and failed to recognize the real nature of the condition. I was more inclined to believe both before and during the operation that I was dealing with a dermoid cyst.

The operation performed on July 12, 1915, proved to be a simple one. There were very extensive adhesions to the omentum, but none to the intestine. The cystic sac and the left adnexa intimately adherent to it were removed. The pedicle was cut deep in the left horn of the uterus, on account of the intimate connection with it.

Upon opening the sac subsequently the true condition was revealed. A pint or more of dense, dark-colored fluid came out and in the cavity appeared the skeletal remnants of a completely macerated fetus.

The tube and ovary though intimately connected with the sac were partially distinct from it. The distal part of the tube was confined in the sac.

The uterine pregnancy present at this time went undisturbed to term.

DR. CATURANI also reported a case of

PSEUDOHERMAPHRODITISM. TESTICLE IN A WOMAN.

Cases with external genitals, apparently of the female type, atrophic hypospadic penis and scrotal arrangement, to simulate labia majora, associated with male glands, are fairly common. On the other hand, cases of real feminine type in the conformation of the external genitals, with testicles as glandular elements, are considered of rather rare occurrence. This latter variety goes by the name of pseudohermaphroditism complete in the classification of Neugbauer or regular "Androgynoides" of Pozzi. A case of this latter type has come under my observation which I submit in its clinical details together with the anatomical data found through operation.

The individual was an Italian, twenty-six years of age. In her family there were only two other sisters, one of whom never menstruated, did not marry, and died at the age of twenty-two, after an operation for hernia. The other sister menstruated regularly, was married, and had two children. The patient had never menstruated. Since her early youth she had noticed the intermittent appearance of a swelling in the left inguinal region.

At the time she presented herself to me she had been married six years and had never encountered any difficulties in sexual relations.

Local examination showed the external genitals evidently feminine but of pubescent type. Everything from the clitoris to the labia majora and minora, urethral opening and the introitus were small but entirely proportionate in their mutual relation. The vaginal canal was of moderate size, width and length, and apparently in proportion to the size of the woman. The vagina ended in a cul-desac, in the center of which the examining finger detected a slight projection (cervix) and a body not much greater in size than the cervix. There was no trace of ovaries on the left side. Deep palpation on the right side brought out a body the size of a large almond, which seemed to be situated high up in the pelvis, almost in the iliac fossa. In the left inguinal region, the canal admitted the finger and under the slightest strain the patient forced out a mass which distinctly contained a solid round body. This mass only partially came out of the external ring and seemed rather to be interstitial.

The right inguinal canal was distinctly weak, but there was no hernia.

General examination showed the patient to be feminine in type. Long abundant hair covered the head but there was no hair on the face. The breasts were fairly well developed. The pelvis was short and broad; the hips were wide. The mental development of the patient was not below normal. She displayed considerable astuteness. She had been continuously deceiving her husband and her sister simulating the normal occurrence of menstrual periods, and giving credit to the occurrence of several miscarriages.

The patient reported the sexual impulse absent, though she passively submitted to coitus. Feminine pudor was apparently absent judging from the way in which she submitted to photography.

Operation was performed on June 24, 1914, through the Pfanenstiel incision, with the purpose of repairing the hernia on the left side, reconstructing the weak inguinal canal, and ascertaining the conditions of the pelvic structures.

Outside of the rudimentary body of the uterus and two folds stretching out from it, there was no trace of uterine appendages in the pelvis. High up in the pelvis toward the sacroiliac synchrondrosis, there was an ovoid body similar to the one removed with the hernial sac of the left side, and which proved to be a testicle.

Pathological Examination.—The area of testicular tissue was 3.5 × 2 × 1.5 cm. It is enclosed in a firm thick tunica albuginea. On section the tissue had the usual appearance of a gland testis with an unusual brownish tinge. The tissue was composed of irregular lobules of characteristic testicular tubules lined by three or four rows of well-nourished cells, sometimes enclosing a lumen. There were no signs of spermatogenesis.

There is a diffuse and focal increase of interstitial cells; in several of the lobules the cells are overnourished and the lobules present an adenomatous appearance. No structures of rete or epididymis were found.

Dr. Thompson T. Sweeney said: "I would like to hear some embryologist explain the feminine development in Dr. Caturani's second case. The woman had a small bud of a uterus about the same size as the cervix, the external genitals were undeveloped and the ovaries were absent yet the woman presented the feminine type. With the absence of ovaries one would have expected her to have tended toward the masculine type of body."

Dr. Arthur Stein said: "Some time ago in Dr. Luckett's surgical division at the Harlem Hospital it was my privilege to examine a woman sent in for examination because she had never menstruated, although she was thirty years of age. She was of the male type as far as stature and hair distribution was concerned. Of the outer genitals only the labia majora were developed. The right one contained a mass which after careful examination was pronounced to be a testicle. There was no entrance to the vagina. The clitoris was about one and a half inches long and a half inch thick with a very well-developed prepuce, the whole very much resembling a small penis. Rectal examination revealed apparent absence of internal female genitals, a condition verified by a subsequent laparotomy."

Dr. S. Wiener said: "Two or three years ago I operated on a case in some respects more remarkable than either of these two. The individual was a private patient and I could not get photographs; the case has therefor never been reported in the literature. This patient was eighteen years of age and had always been considered a girl. She was employed as a stenographer and was entirely feminine in her tastes and demeanor. Her mother brought her to me because she had never menstruated, and there was a swelling in both inguinal regions. The breasts were of a well-developed feminine type; there was no axillary or pubic hair. The development of the external genitals was about that of a twelve-year-old girl. There was a normal clitoris and prepuce, with labia minora and majora. The vagina was about two inches in depth, and save for the absence of rugæ, of normal appearance. A small solid body, like a rudimentary uterus could be palpated in the vault of the vagina. In each inguinal region there was a round ovoid body; this I took to be a double inguinal hernia of the ovary. In doing a double inguinal hernioplasty these ovoid bodies looked so peculiar that I removed the right one for examination, the left being replaced into the abdominal cavity. The specimen removed was examined by Dr. F. S. Mandlebaum who pronounced it a testicle. The whole appearance of this individual was feminine and I did not feel justified in ruining her life by pronouncing her a male. I compromised by telling the mother that if the patient married she could have intercourse in the normal manner, but that she would never have children."

Dr. Sweeney said: "I saw a very interesting case three or four years ago at the Post-Graduate Hospital. A girl was brought into the clinic who was engaged to be married. She stated that there had always been something wrong with her. She was of moderate height, her arms were of a peculiar masculine shape and she had no breasts. We thought this was simply a case of hypospadias. To have told this individual that she was a male would have necessitated a reorganization of her entire method of life. She had hypospasias. She had a pouch for a vagina an inch or an inch and a quarter in depth with undescended testicles. She had a rudimentary penis and we advised operation on this."

Dr. Kosmak said: "These cases bring up the question of the possible legal status of individuals of this kind. Occasions might arise when we would need elucidation as to the responsibilities that attach to the marriage of individuals who are not normal."

Dr. S. Wiener said: "In the case which I cited it was possible that the organ on the left side, which was not removed, was an ovary, and from the legal point of view one might give the patient the benefit of the doubt."

Dr. Thompson T. Sweeney reported a case of

OVARIAN PREGNANCY.

"This patient, twenty-six years of age, from Roumania, appeared in my office August 14, 1916, giving a history of having been married more than a year and during this time had taken no precautions against pregnancy. Her periods had been regular, the last appearing July 3, with moderate flow and no pain and lasting four days. On the morning of July 19, she was seized with sharp severe pains in the rectum and right iliac region, spreading to the whole lower abdomen. There was no nausea or faintness. On the morning of July 21, the patient was again seized with pain, more severe than before and lasting several hours. There was some nausea and abdominal tenderness. July 26 the patient was awakened from sleep with much nausea and cramp-like pain in the lower abdomen. She improved until August 3 when she was confined to her bed for five days. On August 14, when I examined the patient, she stated that she had had no period since July 3. The uterus was forward and slightly soft. A tumor the size of a lemon was found just to the right of the right uterosacral ligament. Uterine pregnancy was ruled out and the diagnosis of extrauterine pregnancy made and operation advised. On August 16 the abdomen was opened and a slight congestion of the uterus observed. There was some free blood in the peritoneal cavity. A large prolapsed ovary was found on the floor of the pelvis beside the right uterosacral ligament. There were no adhesions. The tube seemed normal and was not attached to the ovary. The blood came from a slight rupture of ovarian tissue but the fetal sac was uninjured. The ovary was removed and the abdomen closed. The day after the operation the patient began to have a bloody discharge from the uterus, the first since July 3. The patient was discharged in good condition August 30, 1916."

Dr. Sweeney explained that he had intended to exhibit the specimen which was very interesting, but owing to the absence of an assistant in the laboratory the specimen had been misplaced.

DISCUSSION.

Dr. Caturani said: "I have examined Dr. Sweeney's specimen and consider it one of the most interesting I have seen published. When we have a pregnancy in the ovary the follicle can make a good substratum for the growth of the ovum. With the ovum directly imbedding in the follicle, the successive developing wall of lutein cells, would take the place of decidua.

Dr. M. Rabinovitz said: "I have looked at the photographs presented by Dr. Sweeney and to venture a diagnosis of ovarian pregnancy from a mere picture is rather difficult. The photograph and some facts in the report may as well correspond to a tubal abortion, in which the tube may appear normal and the ovary as was stated showed a mere rupture at one point. The photograph may therefore be that of a blood clot containing an ovum. The crucial diagnostic points in ovarian pregnancy are: (1) the maturation of an ovum in a Graafian follicle without the presence of decidua; (2) the ovum must be surrounded by a layer of corpus luteum cells. In this report these facts are lacking, and not until such pathological proof is submitted can the diagnosis of ovarian pregnancy be made with certainty.

Dr. Caturani said: "I might take exception to what Dr. Rabinovitz has said with reference to the decidua in ovarian pregnancy. As in the tube, we might have in the ovary, what I would simply call an attempt at a formation of decidua. This would be possibly furnished at the expense of inclosures of glandular tissue in the ovary. But in all probability the function of the decidua would possibly fall upon the lutein cells, with the implantation of the ovum directly in the follicle. My stand is that the follicle is the most suitable place for the imbedding of the ovum in the ovary, and this is well demonstrated by the fact that the ovary, as well as the tube, can take care of the ovum but both not as well as the uterus, on account of the insufficiency of decidual formation."

Dr. Sweeney said: "That was the one most interesting point in connection with this case; one could make the diagnosis of ovarian pregnancy without the microscopical examination. The specimen was absolutely free of adhesions. There was a slight rupture of the capsule of the ovary but the tube was not involved at all. While I have not reported the case in full, I have no hesitation in stating that it is an ovarian pregnancy; the sac is directly and intimately adherent to the ovarian tissue. Dr. Caturani has examined the specimen."

Dr. C. F. Jellinghaus reported a case of

CHORIOEPITHELIOMA FOLLOWING A HYDATID MOLE.

"The specimen which I present was removed from a primipara, twenty-three years of age, who gave a history of a four months' pregnancy. A diagnosis of inevitable abortion had been made."

"Examination showed the uterus the size of a six months' pregnancy. The cervix was dilated two fingers and the patient was having labor pains. Since the mole could be readily felt the patient was allowed to deliver it; then she was curetted. After the curettage she bled very profusely. Hemoglobin at this time was 35 per cent. The patient remained in the hospital three weeks and there was no bleeding after the second week. She made favorable progress for three weeks when she was suddenly seized with a fainting spell. The doctor who was called found the woman in a state of shock. She looked as though she had a ruptured ectopic pregnancy, was pulseless and in a state of collapse. She was in too poor a condition to undergo operation at this time. The history of the patient as elicited from the husband ruled out the possibility of an ectopic gestation. It seemed possible that a chorioepithelioma had ruptured into the abdomen. The hemoglobin at this time was 27 per cent. The patient was transfused."

"Examination now showed a cystic mass on either side, chorioepithelioma was strongly suspected. There was no bleeding from the vagina at any time later than two weeks after expulsion of the mole. Laparotomy. For a few hours before the operation there was a little blood in the urine, and on coughing the patient brought up a little blood. We felt that this was practically an inoperable case. Panhysterectomy, removal of double ovarian cyst. The patient was not operated upon earlier because of her extremely poor condition. She died three days after operation."

"About thirty microscopical sections have been made. They all show a great deal of necrosis, a few typical chorioepithelioma; one of the cysts was a corpus luteum cyst. This brought up the question whether the pressure of the cyst on the corpus luteum was the original cause of the hydatid mole."

"One thing I would be inclined to insist upon and that is that every woman who has passed a hydatid mole should be curetted again three weeks after the discharge of the mole. By that time there should be complete regeneration of the endometrium, at any rate no cystic villi should be present. If three weeks after passing of a hydatid mole a curettage reveals further cystic villi—even if not a typical chorioepithelioma I think a hysterectomy is indicated."

DISCUSSION.

Dr. S. Wiener said: "I can recall a case in which the patient was being operated upon for another condition and an early chorioepithelioma was discovered by chance. The operator was performing an interposition operation for partial prolapse of the uterus; in delivering the uterus a small cauliflower excrescence was seen on the fundus. This was incised and was found to be continuous with a diffuse tumor in the uterine wall. Panhysterectomy was performed. Microscopic examination showed the growth to be a chorioepithelioma. This woman has remained well."

Dr. Arthur Stein said: "Cases of chorioepithelioma are still of rather rare occurrence and are also extremely malignant. They can, however, be radically cured if diagnosed early enough. I recall one case which I saw fifteen years ago, where about four to six weeks after a normal confinement a considerable hemorrhage caused us to perform a curettage. The microscopical diagnosis was typical chorioepithelioma and removal *in toto* was promptly performed. The growth which was about the size of a peanut was found to be located in the posterior wall of the uterus. The patient remained well. Another case which I can recall was somewhat similar to that of Dr. Jellinghaus. The patient stated that she had been bleeding for weeks after an abortion. In this case an operation was unfortunately impossible as the chorioepithelioma had already invaded the adjacent tissues and metastasis had occurred in distant organs."

Dr. M. Rabinovitz read a paper on

ADENOMA OF OVARY.*

DISCUSSION.

Dr. S. Wiener said: "There does not seem to be any doubt but that the pictures thrown upon the screen and the sections under the microscope show typical adenomyoma; but I want to take exception to the terminology. Dr. Rabinovitz has called the tumor an adenomyoma of the ovary, and he also states that no such growth has ever been previously described. It seems more probable that the adenomyoma has sprung from the ovarian ligament. The ovarian ligament contains smooth muscle tissue, just as the round, broad, and uterosacral ligaments do. My idea is that this tumor, springing from the ovarian ligament, has grown into the substance of the ovary, mechanically displacing normal ovarian stroma, with which the sections show it to be in contiguity. My point is should we call this an adenomyoma of the ovary?"

Dr. Arthur Stein said: "Years ago I published some studies of adenomatous growths in the Fallopian tubes, having at that time come to the conclusion that they were very frequently due to chronic irritation. I therefore believe with Dr. Rabinovitz that in his case also, chronic inflammation and consequently chronic irritation may have had something to do with the development of adenomyoma in question."

Dr. Rabinovitz said: "I am pleased to hear that Dr. Stein coincides with my view on chronic inflammation as an etiological factor of adenomyatous proliferation. Regarding Dr. Wiener's remarks on my terminology of ovarian adenomyoma I wish to reiterate, that the congenital theory as well as the inflammatory contain sufficient probabilities for this morphological change to have occurred, but what is still more pertinent, is the fact, that ovarian stroma does contain smooth muscle fibers. The old teachings therefore that the ovarian stroma is a purely connective-tissue structure must be modified, and adenomyomatous formations may therefore occur in it as well as in the uterus or in the tube. I am glad to have had the fortune of recording what I believe to be the first case of ovarian adenomyoma.

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* For original article see page 67.

REVIEWS.

Manual of Military Hygiene for the Military Services of the United States. By Valery Havard, M. D., Colonel Medical Corps United States Army, Retired: Former President, Army Medical School. Published under the Authority and with the Approval of the Surgeon General United States Army. 8vo. pp. 786. Second Edition, thoroughly revised and greatly enlarged. Illustrated with seven plates and two hundred and fifty-one engravings. New York; William Wood & Company: 1914.

Formerly medical officers were primarily surgeons, now they are chiefly sanitarians, for their most important work has come to be the prophylaxis of disease. It is evident that if camp diseases can be prevented or controlled good sanitation will keep more men on the fighting line than the most perfect surgery. It follows, therefore, that most medical officers must be good sanitarians, while comparatively few need be skilled surgeons. To help them to acquire a broad knowledge of army sanitation the study of books like this one of Colonel Havard is to be strongly urged as a preliminary aid to actual service in camp or field.

This manual presents clearly and very concisely in its sixty-two chapters the science and art of military hygiene as it has been developed in this country during the last few years and taught in the Army Medical School.

A Complete Handbook for the Sanitary Troops of the U. S. Army and Navy and National Guard and Naval Militia. By Charles Field Mason, Colonel Medical Corps, U. S. A. 8vo. pp. 500. Fourth Edition, revised. Approved by the Surgeon Generals of the Army and Navy. Profusely illustrated. New York; William Wood & Company: 1917.

This work is intended as a text-book for the use of the Medical Department in the instruction of the Sanitary Troops. It is divided into eleven parts. Part I describes the organization, duties, and rules for sanitary troops in Post and in war; Part II describes the very elementary anatomy and physiology required; Part III instructs in first aid; Part IV in nursing; Part V in mess management and cooking; Part VI in materia medica, therapeutics and pharmacy; Part VII in hygiene, post and camp sanitation; Part VIII in riding, packing and driving; Part IX in army regulations; Part X in clerical work; Part XI in minor surgery.

The style of the book is very clear, the descriptions concise and simple, the subject matter practical, the revision very carefully brought up to date. The drill regulations for sanitary troops have been omitted from this edition, while the chapters on nursing and on pharmacy have been considerably expanded.

EMERGENCY SURGERY. By JOHN W. SLUSS, A. M., M. D., F. A. C. S. Associate Professor of Surgery, Indiana University School of Medicine; Surgeon to the City Hospital. Fourth Edition, revised and enlarged; pp. 847; octavo; 685 illustrations. Philadelphia. P. Blakiston's Son & Company. $4.00 net.

This little book was planned to help the general practitioner in his surgical emergencies and so has been made concise and practical. It has rapidly gone through four editions. In the present volume the text pertaining to the surgery of war shows careful revision. The treatment of wound infections has been completely rewritten incorporating much of the latest experience and practice from the European battlefields.

HANDBOOK OF SUGGESTIVE THERAPEUTICS, APPLIED HYPNOTISM, AND PSYCHIC SCIENCE. A Manual of Practical Psychotherapy, Designed especially for the Practitioner of Medicine, Surgery, and Dentistry. By HENRY S. MUNRO, M. D., Omaha, Nebraska. Fourth Edition, revised and enlarged. 8vo. pp. 481. C. V. Mosby Co.: St. Louis, 1917.

One of the oldest curative measures known to medicine is suggestion. It has appeared in various guises from the time of the incantations of a Merlin to the anociassociation of a Crile. Its employment by the charlatan has compelled its study by the physician. Its intelligent and proper use has resulted in much good, so that from being looked on with suspicion, or worse, it has now become an accredited part of the armamentarium of every progressive medical man. The growing appreciation of this fact has made necessary within a few years four editions of Dr. Munro's book. Not because we can agree with all the author states, but because of the practical application of much of its subject matter to their everyday work we can recommend the book to all medical men.

THE GROWTH OF MEDICINE FROM THE EARLIEST TIMES TO ABOUT 1800. By ALBERT H. BUCK, B. A., M. D. Formerly Clinical Professor of Diseases of the Ear, Columbia University, New York. Consulting Aural Surgeon, New York Eye and Ear Infirmary, etc. Yale University Press, New Haven, Conn. Price $5.00 net.

Among those departments of medical study which have not received a sufficient degree of attention in this country we may primarily refer to the history of medicine as a subject worthy of comment. The stress of life in a rapidly growing country may in part, however, account for the desire to acquire only that knowledge for the degree of Doctor of Medicine which is of a strictly practical character. Professor Buck, the author of the excellent treatise herewith reviewed, is also of the opinion that the books that are accessible to English speaking physicians are too elaborate, and we might add too obtuse and abstract in character to appeal to either the undergraduate or the practising physician. The present volume is the outcome of a desire on the part of the author to provide a history of medicine which shall present the essential facts truthfully and with a sufficient degree of attractiveness to retain the interest of the reader, and before going any further it may be safely stated that this object has been satisfactorily attained. In this connection commendation should also be extended to the Williams Memorial Fund, which makes it possible for Yale University to accept for publication medical treatises of a class that would have no commercial appeal.

Dr. Buck defines nine periods in the history of medicine which he takes up in turn and describes the essential features of each. It is interesting to trace the development of medical knowledge and the close alliance between this subject and religious beliefs in earlier times. We find, however, that superstition seems to have survived even to the present day as a basis for certain medical practices and the supposed alliance between religion and medicine has not as yet disappeared from our modern life as may be witnessed in the development of various cults that depend entirely on the exercise of religious practices, questionable though these may be on closer analysis. From the time of Hippocrates, however, we find attempts at divorcing the functions of the physician from those of the priest and although this development may have received set backs it is fortunately still progressing. The early Jews also acknowledged a distinction between the practice of medicine and the priestly function and we owe a great deal to these people, especially in the lines of hygiene, practices which have even survived to the present time. It is Greek medicine, however, which has served as a basis for the development of our modern medical knowledge and we may even regard the Aesculapian temples as the prototypes of the modern hospital. Archaeological studies have disclosed that they served not only as places where the sick could recuperate but also where instruction was given.

Dr. Buck devotes an interesting chapter to the significance of the serpent in the statues and votive offerings exposed to view in the Aesculapian temples and which has served as a professional symbol ever since. It is interesting to note moreover that the religious and mystical features associated with the treatment in the earlier days of these Aesculapian temples gave place more and more to rational therapeutic measures, and one is surprised moreover by the diagnoses which were made even in those apparently primitive times. The work and writings of Hippocrates constitute the higher development of early Greek medicine and have served as a basis for much of what has followed in the later history of medicine. We find that soon after this specialities began to be developed and likewise sectarian schools, a subject which Professor Buck discusses in a most entertaining manner in his book. The next epoch is taken up with the history of medicine at a time when Alexandria in Egypt constituted the school of greatest intellectual activity, and then we find that the teachings of Galen began to exert a preponderating influence which extended up to the seventeenth century and is characterized by the gradual diminution of the influence of Greek medicine During the Middle Ages the most characteristic feature in medicine was the important part played by the Arabs. During the fifteenth and sixteenth century, the period of the Renaissance, we find a new era of development in which the actual dissection of human bodies contributed a more effective basis for satisfactory medical study. Modern medicine may be said to begin in the seventeenth century and Dr. Buck completes his book with the period which extends to about 1775, which marks the discovery by Jenner in the field of vaccination.

Professor Buck's work is deserving of the hearty commendation and attention of physicians and particularly of medical students, who will thus have an opportunity of being informed of the development of an art and science which has had such an important bearing on the welfare of the human race. The development of this conception will also contribute very greatly to the respect and feeling which the young practitioner must necessarily entertain toward his profession.

A final word of praise may be given with respect to the make-up of this interesting book, which is well written and printed and illustrated, and being more or less of an innovation in the field in this country should receive an extended circulation.

BRIEF OF CURRENT LITERATURE

OBSTETRICS.

Myomectomy in Pregnancy.—Emilio Alfieri (*Ann. di ost. e gin.*, Aug., 1916) says that the tolerance of the uterus to operative procedures has been shown to be very great. Pregnancy is often not interrupted by ovariotomy, or by simple myomectomies. Even the cervix may be amputated without interrupting pregnancy. The author gives the history of a case observed by him, in which a subserous, pedunculated fibroma of the fundus was removed in a primipara at one month of pregnancy without interruption of pregnancy. The tumor was in an advanced state of necrosis and could not have been left in place without producing sepsis. It was so soft that it was supposed to be an ovarian cyst when the operation was undertaken. The patient already suffered from pain and from symptoms due to the absorption of poisons from the tumor. To-day myomectomy in pregnancy gives a maternal mortality of about 8 per cent., and a frequency of interruption of pregnancy of 20 per cent., while the fetal mortality is 25 per cent. This is in contrast to 3 per cent. of deaths under expectant treatment, with 20 per cent. of interruptions, and 13 per cent. of fetal deaths. The author thinks that in case of myoma complicating pregnancy we should watch the patient carefully and interfere only when we see that there are symptoms due to the presence of the tumor that threaten the life of the patient. We should then promptly do a myomectomy, simple or enucleating, whenever there will be left a condition of sufficient integrity of the uterus to allow pregnancy to go on to term. Subserous pedunculated fibroids may be removed without waiting.

Placental Necrobiosis.—E. Zarate (*Ann. de gyn. et d'obst.*, Nov.-Dec., 1916) describes as necrobiosis a condition in which after the removal of a fetus there remains in the uterus a portion of the placenta which does not immediately become septic. It forms a pedunculated or sessile tumor increasing in size, which is generally described as a polypus, fibrous or placental. There is abundant hemorrhage and sometimes the mass is expelled spontaneously. The author prefers to call the process necrobiosis. He describes a case, and gives the results of the histological examination of the tumor. It contained true uterine mucosa, epithelium, glands, and interstitial tissue at one portion. The villi were firmly pressed together and fibrin took the place of the maternal blood.

Advanced Extrauterine Pregnancy with Living Child.—W. G. Lee (*Surg. Gyn. and Obst.*, 1917, xxiv, 317) records a case of abdominal pregnancy in which he removed a living child weighing 4½ pounds which died half an hour later. The mother died from secondary hemorrhage from the placental site. The writer says that advanced extrauterine pregnancies will continue to present problems of operative treatment. Spurious labor marks a danger to fetal life. When the fetus is viable, interference should be as near term as possible. Primary laparotomy should be the operation of choice. When the fetus is dead laparotomy should be done without delay. In all conditions of the fetus: Total extirpation of the cyst, where feasible, gives the lowest maternal mortality. Enucleation of the placenta alone, where feasible, gives the next best prognosis, but it demands adequate preliminary hemostasis. Marsupialization should be the last choice because of its higher mortality. The general technic of operation to be followed is: Incision, either median or external rectus, through the abdominal wall, but as much as possible outside of the placenta, should this present. Open the sac in the least vascular area available, and remove the baby with careful avoidance of traction on either cord or sac. Make a careful exploration of cyst connections. If these are pedunculate ligate the pedicle and enucleate the whole cyst *en masse*, if this can be done without violence. If these are not pedunculate, and especially with a history of tubal abortion: Do a preventive hemostasis by ligating the uterine and ovarian vessels, also all omental connecting vessels that are visible, using great care not to pull upon or tear the sac. If the placental location prevents ligation of the uterine and ovarian vessels secure preliminary control by either digital or instrumental compression of the abdominal aorta with subsequent ligation of these vessels. Then without hesitation or delay separate the entire placenta rapidly and completely and with it bring the membranes up gently in order to ligate any vessels running through them to the placental mass, even in their transparency. Avoid strictly the use of undue force either with the fingers or with instruments throughout the separation and extraction of membranes. If marked oozing follows, tampon with a Mikulicz drain; otherwise leave a cigarette drain for forty-eight hours as a safeguard. Do not close the abdomen without some drainage. Consider marsupialization only where rapidity is indicated because of urgent need for the completion of the operation, or where because of exceptional location the removal of the placenta would either endanger the integrity of adjacent organs by denudation or laceration, or prevent proper hemostasis thereafter.

GYNECOLOGY AND ABDOMINAL SURGERY.

Ectopic Pregnancy.—F. R. Oastler (*Surg., Gyn. and Obst.*, 1917, xxiv, 224) presents an analysis of 106 cases of ectopic gestation. On the basis of the supposed causes of tubal pregnancy, a cause for the abnormality was present in about one-third of the cases. The pathological conditions found led to the conclusion that ectopic pregnancy occurs about as often on one side as the other. If previous inflammatory condition of the tubes were the sole cause, we would expect the condition to be more prevalent on the left side. The pregnancy is located about as frequently in the inner half of the tube as the outer; interstitial and ovarian pregnancies are of rare occurrence. Tubal abortion is the variety of rupture most commonly found, whereas of the other varieties erosion of the tube is very much more common than rupture from overdistention. Severe hemorrhage may occur from tubal abortion and erosion of the tube. It is uncommon for the ovarian artery to be eroded. Rupture into the broad ligament is conspicuous by its absence. Double ectopic pregnancy is very uncommon; ectopic may be associated with normal pregnancy; interstitial ectopic may push its way into the uterus and continue to grow; it is possible for ectopic pregnancy to occur twice on the same side. The termination of ectopic pregnancy usually occurs in about six weeks, pregnancies later than three months being uncommon. Most ectopic pregnancies die (*a*) and are discharged into the abdominal cavity and absorbed; (*b*) they become a tubal mole and are absorbed; (*c*) the fetus disintegrates and forms an abscess in the abdominal cavity. The pain of ectopic pregnancy is often very much like the cramps of intestinal colic, and associated feeling of faintness, vomiting, chilly sensations and constipation may simulate intestinal disturbance. The classic feature of a skipped period is absent in a majority of cases. Irregular spotting or severe bleeding continuous with menstruation or during the intermenstrual period is present with considerable regularity. Some temperature is present in almost every case, with a range between 99.5° F. and 100.5° F. Pulse rate and blood pressure are of little diagnostic importance except in those cases where the frequency of the pulse is out of proportion to the temperature. Leukocytosis is present in a large proportion of the cases, and a low red count is generally accompanied by a high white, but this does not occur regularly and the results are often confused. The presence of albumin and casts in the urine in a large percentage of cases is significant. Irritation of bladder and rectum is much more common than is generally supposed. Physical examination reveals the usual signs of peritoneal irritation, tenderness, distention, and rigidity—more or less pronounced; and often discloses a mass in the pelvis. These symptoms, however, are present in salpingitis. There are certain symptoms, nevertheless, which seem to be of special value: (1) exquisite tenderness out of proportion to other local symptoms; (2) the situation of the uterus in the normal position, movable and not in retroposition fixed; (3) the boggy sensation to the mass in some cases; (4) the enlarged uterus and soft cervix; (5) rarely the blue vagina. In many patients, however, there is nothing but exquisite localized tenderness to guide us in our diagnosis. All subacute ectopic pregnancies should be operated on at once, removing from the abdomen the tube affected, the fetus, placenta, membranes, and blood. All acute cases should be operated on at once except cases *in extremis*. In these cases it would seem advisable to wait, watching the patient very carefully. If no improvement occurs in a very short time, operate. Two cases of this series bled to death. The ovarian artery had ruptured in both. One was an interstitial pregnancy. As there is no doubt, therefore, that patients can bleed to death, operation must not be delayed too long in waiting for a reaction in these extreme cases. The abdominal route was chosen in all these cases and it is undoubtedly the only safe procedure to follow.

The Toxemias of Pregnancy.—By analyses in a number of cases, J. R. Losee and D. D. Van Slyke (*Amer. Jour. Med. Sci.*, 1917, cliii, 94) find that the toxemias of pregnancy can be attributed neither to failure in diaminization of the aminoacids, nor to the moderate degree of acidosis observed. The nature of the toxin or toxins therefore remains unknown. The nature of the functional disturbances which cause the abnormal nitrogen metabolism observed also still awaits a satisfactorily conclusive explanation. Nevertheless the constancy of the low urea ratios in the urine in eclampsia, and of high ammonia in pernicious vomiting, lends decided support to the opinion of Ewing and Wolf, that the nitrogen distribution of the urine, considered "in connection with all the data in the case," should assist in diagnosing the toxemias of pregnancy, and in differentiating them from conditions such as nephritis and transitory gastric disorders.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE MEDICAL SOCIETY OF NEW YORK.

Meeting Held in Utica, N. Y., April 24, 25, *and* 26, 1917.

SECTION ON PEDIATRICS.

EDWARD J. WYNKOOP, M. D., of Syracuse, *in the Chair.*

DR. CARL G. LEO-WOLF, of Buffalo, read a paper entitled

SOME ASPECTS OF INTERNAL HYDROCEPHALUS.

This paper is based on the report of two cases. The first baby was born July 9, 1915 and did well until December, 1915. At this time it was taken ill with convulsions, high fever and what the mother described as a cold. The family history was negative. When first seen by the speaker, March 31, 1916, physical examination was negative, but convulsions had become more frequent, as many as ten occurring in twenty-four hours. Lumbar puncture showed a clear fluid under high pressure. Fifteen cubic centimeters were removed for bacteriological examination, which was found negative at different times, but containing from eight to twelve cells. The patient remained in the hospital under treatment for five weeks. Since that time his mother had brought him for lumbar puncture at times when she thought from his increased restlessness that he might have another convulsion. Though the child still had an occasional convulsion he had gone as long as two weeks without any. Up to March 1, 1917, nineteen lumbar punctures had been made, four of which were unsuccessful; at the other fifteen punctures 240 c.c. in all of spinal fluid was removed.

The second patient was born September 29, 1914 and had likewise a negative family history until December, 1915 when she had a fall downstairs. After this she had convulsions, at first daily; since, more rarely. She was first seen by the speaker on November 24, 1916, at which time she was having a convulsion about every three weeks; the convulsions were preceded by restlessness and irritability. Physical examination was negative. Macewen's sign was present, the patellar reflexes exaggerated and both fontanels closed.

Lumbar puncture yielded 13 c.c. of clear fluid under high pressure. In this case six lumbar punctures had been made, by which 150 c.c. of fluid had been removed. This fluid showed a cell count between 110 and 270 per cubic centimeter. The bacteriological examination was negative; the Wassermann negative; the blood showed 6600 leukocytes. During her stay in the hospital it was noticed that her head would droop suddenly several times a day and that she put her fingers into her ears several times a day, often before having a convulsion.

Dr. Leo-Wolf regarded Case I as due to an acute attack of encephalitis and Case II as due to a traumatic encephalitis. In both cases the foramena Monroi and Magendi remained open, thus influencing the favorable prognosis and the evident result of the lumbar puncture, which in this class of cases seemed to him to offer the only chance of ultimate and permanent recovery.

DISCUSSION.

Dr. Elias H. Bartley, of Brooklyn.—Do you think the convulsions were due to pressure or to irritation? Drawing off the fluid and relieving the pressure seemed to check the convulsions for a time, but I think the pressure alone does not explain the production of the convulsions and that there must be some irritation in addition. The fluid drawn off does not seem to indicate the presence of much inflammatory trouble. Perhaps if Dr. Leo-Wolf is able to report on the autopsy findings later on he will learn more as to the cause of these convulsions.

Dr. Leo-Wolf.—I have considered the convulsions as due to pressure; if there had been local irritation it would seem that the convulsions would have been localized instead of general.

Dr. J. Roberts Johnson, of Syracuse, read a paper on

PRACTICAL INFANT FEEDING.

A large percentage of mothers could nurse their babies if sufficient effort was made before weaning. Nothing necessary to good health and digestion need be eliminated from the mother's diet. Too much food, and especially liquid food may defeat our purpose. Outside of three full meals a day and 1 quart of cow's milk in twenty-four hours, I recommend no galactogues. Gruels and bitter tonics may be given in cases in which there is loss of appetite and anemia. Percentage feeding is impractical for the mass of the people. With increasingly satisfactory results I have used whole milk, diluting it with water in accordance with the digestive capacity of the infant and adding sugar. We no longer believe that protein is the chief offender in gastrointestinal disturbances but are agreed that fat and sugar are chiefly at fault. The normal infant requires at a meal 1 or 2 ounces more food than it is months old, up to 8 or 9 ounces. The normal infant should gain from 5 to 8 ounces a week. During the second six months the gain is steadier. The number of ounces of whole milk needed is practically twice the number of pounds the baby weighs. This is on the assumption that a 4 per cent. milk is used. The sugar demand is fairly fixed, ranging from ¼ ounce in the young infant to 1½ ounces after three months of age up to ten or eleven months, when full milk is given and no sugar added. In the infant as in the adult the definite amount of food needed is best expressed by calories. An ounce of whole milk is equivalent to 20 calories. An ounce of any kind of sugar is equivalent to 120 calories. The average child under four or five months requires from 45 to 55 calories per pound of body weight. The same child if very fat requires only 40 calories, while if the same child was emaciated, 60 to 65 calories might be needed. In preparing the food for twenty-four hours, first determine the caloric needs of the child, judged by its physical condition and history of digestion. Knowing its weight in pounds, multiply this by the calories. Subtract the sugar calories from the whole number needed and the difference equals the milk calories, which if divided by twenty, would give the number of ounces. Water is then added to give the required quantity. There is no hard and fast rule as to how many calories a baby needs to make a normal gain. The fat quiet baby needs less than the atrophic, restless one. The reckoning of calories, therefore is to act solely as a guide to check against overfeeding in the total. It does not add to the make-up in the various ingredients of the formula. Few babies can digest more than a 5 per cent. fat, and 3 per cent. is a safer amount. Fat is given with the mistaken idea that it overcomes constipation and for the purpose of causing a rapid gain in weight. Fat mixtures should not be given babies having acute indigestion. For a number of years the writer has used malt sugar in the form of dextrimaltose almost exclusively, during the first six months. Later when the digestive capacity and gain is steadier cane sugar may be used with equally good results. Practically all artificially fed infants are constipated and malt sugar is helpful in relieving this condition. Likewise if the fat tolerance is low one can give an increased amount of sugar. If development is slow one can occasionally give protein above the normal amount. Condensed milk may sometimes be used when other foods fail. The usual dilution is 1 part of Eagle Brand milk to 9 parts of water, which gives a mixture of practically 1 per cent. fat, ¾ per cent. protein, and 5½ per cent. sugar. The low fat content in this mixture may explain our failure with the modified cow's milk formula. Most infants, breast- and bottle-fed, take larger quantities of food than the standard text suggests. Some infants grow normally on one-half to one-third that required by others. As a rule, no infant should be fed the minimum food even if it appears healthy. If the physiological reactions are normal it is better to over- than to underfeed. For the growth and nutrition of the infant, a mixture of fats 3 to 4 per cent., sugar 6 per cent. or even 7 per cent., proteids 1 to 2 per cent., mineral salts and water is best, but such an artificial food is not well tolerated except by the strongest digestion. It would be impractical to attempt such a formula in the early weeks of life. Boiled milk is not an inadequate food for infants, provided its use is maintained only during the early months; when the infant is older and the digestive functions have become accustomed to cow's milk the writer uses it raw. As an antiscorbutic every artificially fed infant should be given orange juice, preferably without sugar. Seven meals in twenty-four hours are sufficient up to the fourth or fifth month, and then six meals up to the tenth month. Many children do better during their second year with only four meals. The digestive capacity of each child must be determined by close study of the individual child. Considering that from 20 to 30 per cent. of all infants are bottle-fed and that the problem of feeding rests largely with the mother and general practitioner, would it not be worthy of this organization to recommend a uniform method practical in its application and efficient in its results?

DISCUSSION.

DR. FRANK VAN DER BOGERT, of Schenectady.—Many nursing failures depend upon the elimination from the diet of the mother of foods supposedly harmful to the milk and upon overfeeding of the mother in an effort to make milk. My practice is to allow anything, acid or otherwise, which is not known to upset the digestion of the mother or which cannot be directly shown to upset the baby. The laity should be educated to the dangers of underfeeding or of feeding an unbalanced diet. Not long ago I was called to see a nursing mother who had been told to eat nothing but potatoes, and was later advised to "cut out" potatoes.

On the other hand, overfeeding is, no doubt, a frequent cause of indigestion and of failure of the breast supply. I should go further than Dr. Johnson and advise three meals a day and milk only when there is an appetite for it and at definite periods with relation to mealtimes so as to allow of good digestion and assimilation. Nurses are often responsible for overfeeding. Constipation in the nursing mother is often a source of trouble in the nursing baby. I have little doubt but that in some direct or indirect way laxatives render the mother's milk supply unpleasant to the baby. The constipation itself must be responsible for toxin elimination in the milk. It is not a difficult matter to treat constipation without drugs and routine daily enemas are seldom necessary. Bran and agar-agar usually suffice and have no effect whatever on the milk. The prescription of regular habits for the baby is just as important as for the mother. Too frequent night feedings, the effort to get water into the baby between meals, by sweetening it with sugar, together with irregular and too frequent feedings I should consider as the most usual causes of failure from the baby's standpoint.

I must take exception to Dr. Johnson's statement that it is wiser to overfeed than to underfeed. If I must do one or the other, during the first six months at least, I should prefer to underfeed, because I believe that many of the troubles of the second summer depend upon early overfeeding. But we do not have to underfeed sufficiently to do harm.

We may talk as much as we like about amplified feeding, but every baby does not thrive upon a simple milk and water dilution, even when it is boiled and sugar added. Our ability to feed properly depends upon our ability to interpret symptoms and to elicit a history of just causes of trouble.

Dr. William B. Hanbidge, of Ogdensburg.—It is considered a crime for the obstetrician to treat babies and my excuse for speaking is that I have committed this crime many times. We obstetricians get the babies when they are healthy and the pediatrician gets the baby when something has gone wrong. It is very difficult to treat a sick baby and the pediatrician needs every resource available. If we could put a paper like Dr. Johnson's in the hands of every general practitioner telling him how to feed babies in a simple way we would not get so many babies that have gone wrong.

I have from time to time tried the various methods of infant feeding that have been popular. I have seen mothers become discouraged when trying to use the percentage method and resorting to commercial foods, and it cannot be denied that sometimes they have obtained better results with the commercial preparations.

For twenty years I have been feeding babies on whole milk with the addition of a little sugar and have had good results. I have tried citrated milk and citrated and pasteurized milk, and have had the same results from whole milk that had been boiled but not citrated. I have learned also that it is not necessary to put sugar in the whole milk.

Another point is that the babies I have fed in this way got very little water, only 2 to 4 ounces a day. As a rule, the babies fed on whole milk were not constipated, and they had no skin diseases. The lower animals do not begin to drink water until they begin to eat. The mother's milk supplies enough fluid until the baby begins to take other food. If we are going to be successful in the artificial feeding of babies among the poor the method must be simple.

Dr. Conway A. Frost, of Utica.—I allow the mother to have any food that agrees with her. I was glad to hear Dr. Johnson bring that out for it is a particular hobby of mine. There is more trouble from the mother worrying over the cook and household affairs than from her diet. If we can keep the mother's nerves down we will not have to pay so much attention to her food. When called to a mother who is having trouble with her milk supply the question I ask is not "What have you been eating?" but "What has the nurse been doing?"

Dr. W. Wooden, of Rochester.—I have been working in Dr. Rachford's clinic in Cincinnati and have used various methods. Dr. Rachford uses a great deal of condensed milk and finds it is very satisfactory. When babies have constipation we find the condensed milk method very good. Many babies that do not do well on other methods will do well on peptogenic milk powder. I would like to hear Dr. Johnson speak on this point.

Dr. Carl G. Leo-Wolf, of Buffalo.—I am still urging feeding at four-hour intervals, five times a day. I also wish to recommend Dr. Jacobi's advice of using cereals and top milk. I have found it a good plan to first ascertain what kind of food the baby will thrive on and then to make an investigation and find the percentage and caloric value of that food. I have tried the whole milk as Dr. Hanbidge has recommended and do not get the advantages that he claims. I am in favor of feeding potato water or orange juice, and I believe that a baby six months old should have some additional food in the way of a pap or vegetable soup, made thick, and of any of a number of vegetables.

As to the feeding of mothers, the hospital diets leave much to be desired. I think hospital dietitians ought to give this matter more attention. The diet of the mothers should be something that they like and are accustomed to eating.

Dr. C. A. Mercer, of Syracuse.—We have been discussing details but there is one factor that we have failed to take into consideration and that is the digestive power of the baby. Consciously or unconsciously we train babies to eat what we want to feed them. A New York man will feed excessive fats and to a certain point will be successful; the Italian mother will feed her baby adult food with comparative impunity; the child adapts itself to these things. In infant feeding we must take this factor into consideration.

Dr. Johnson, of Syracuse.—In my reference to overfeeding rather than underfeeding, the thought that I had in mind was that many children because of a lack of proper proportion in the food elements lose weight and are more susceptible to any intercurrent disease that comes their way.

The whole milk feeding I have not used but as I stated in my paper I believe in using whole milk in larger quantities and with less diluent than do many others. The citrated milk I have used but I have not found that it possesses any advantages over bicarbonate or large quantities of lime water. I have largely discarded alkalies.

As to condensed milk, I think we may say of condensed milk what may be said of all other artificial foods, namely, that we should know the content of the milk preparation we are using. If we know the content of a preparation and mix it with whole cow's milk we will not go far wrong.

As pediatricians we should organize and present to the general practitioner a method of infant feeding simpler than the percentage method and that until we do this there will continue to be an increased sale of proprietary foods.

INDICANURIA IN CHILDREN.

Dr. William J. Schuyler, of Utica.—During the past four years I have been impressed with the frequency with which indican in the urine seemed to be associated with many of the ills of the growing child. Indoxyl potassium sulphate, is said to be indol absorbed from the intestinal tract, changed in the liver to the above-named substance, an ethereal sulphate, and finally excreted in the urine. The tests for indican in the urine are simple and fairly accurate. The presence of more than a trace of indican in the urine is an indication of a morbid condition which if neglected may eventually lead to disastrous results, possibly forming the basis of a bodily habit that in later life would be found responsible for those cardiovascular and renal changes that tend to premature old age or actually shorten life by many years. That this habit begins in childhood is a well-established fact. We are here considering that type of indicanuria which results from marked putrefactive changes of the proteid content of the intestinal tract through the action of intestinal bacteria.

The two chief preliminary conditions favorable to the development of indicanuria seem to be the ingestion of food proteids, especially those found in meat, in excess of the bodily requirement, and the presence in the intestinal tract of germ life which has the effect of producing putrefactive changes in this proteid content. Swallowing infected mucus from the nose, throat or bronchial tubes may start the process going, or the same thing may happen from decaying or infected teeth or from some morbid tonsil condition. Improperly prepared food, or food which is unsuitable or difficult of digestion, may be the purveyor of bacteria of putrefaction. Children who show a more or less constant tendency to indicanuria are seldom well. They often seem nervous and irritable and prone to outbursts of temper. They are often fickle in appetite and crave food that belongs properly only to adults. The circulation of the child who is toxic with this agent never seems quite free or perfect. The oxygen-carrying capacity of the blood seems considerably diminished, and after a time a condition of anemia of simple type is found to exist. The sphygmomanometer usually at this stage shows a lowered arterial pressure. The mucous membrane of the indicanuric child seems much more susceptible to outside influences and germ infections. These children are constantly taking cold. They often complain of rheumatoid pain and it is a question whether the so-called growing pains of childhood may not be at least indirectly due to this underlying cause. In many instances these children give little or no evidence of tangible illness so that the advice of a physician is not considered essential and nothing is done to correct the trouble. These are the cases that drift along never quite well, perhaps never really ill, until reaching adult life, when they begin sooner or later to show evidences of circulatory changes of a different type. At this time traces of albumin may be found in the urine, and an occasional tube cast may be discovered. The victim may suffer from slight dyspnea and occasional sensations of vertigo. From this time on the picture is one with which all medical men are familiar. These are the individuals the Life Insurance Company either declines or rates many years in advance of his actual age; his days on earth are not as long as that individual whose urine from his childhood up has been free from indoxyl potassium sulphate.

DISCUSSION.

DR. WALTER LESTER CARR, of New York.—In going over the records of fifty children who had various nervous conditions I found only one giving indican in the urine. The general description as given in the paper is very much as one sees it. The fault seems to lie with the protein and especially the protein of meat. If one looks into the family history of these children he finds a tendency to so-called lithemia, a gouty tendency, with changes in the arteries, joints and various tissues. It is not only the food that is at fault but there is a natural predisposition or susceptibility. These children are irritable, have headaches, neuralgia, poor circulation, etc. In the care of these children meat must be discarded and we must see that they get sufficient exercise and that proper attention is paid to hygiene. We should endeavor to give these children all the oxygen possible. They should sleep outdoors. All children with indican are more likely to have adenoids and the reverse is also true.

Acute attacks of indicanuria are best treated by colonic irrigations, laxatives and starvation. In the medical treatment the addition of lactic acid bacilli gives some aid. Whether the results thus obtained are permanent depends on the after-treatment. There is no use giving lactic acid and then going back to a faulty diet. This treatment is simply useful to reinstate the intestinal digestion and then further attention must be directed to diet, outdoor life and hygiene.

Reference has been made as to the possibility of indicanuria being a predisposing factor in poliomyelitis. In a study of sixty cases of poliomyelitis, I have no recollection that indican was present. In a certain number of cases in which indican is present we also have acetonuria. In cyclic vomiting where we have recurrent attacks, we do not always expect to find indican; we may at one examination find indican and at the next find acetone. The whole thing is a metabolic disturbance due to protein decomposition, and if these children are placed on proper diet and under proper hygienic conditions, very little medication is needed, provided they have local treatment for removal of adenoids or tonsils and attention to general nutrition.

DR. ELIAS H. BARTLEY, of Brooklyn.—Indicanuria in young babies is always abnormal. In looking over the records of some 400 babies, Rouse, some six or eight years ago, found that there was never any indication of indican in the urine on the first day after birth; on the second day, rarely; on the third day, quite frequently; on the eighth or ninth day never, unless there was a gastrointestinal infection. The intestinal tract in the new-born baby was practically aseptic, but in the course of twenty-four hours, if a child was given only sterile food, there was an infection of the gastrointestinal canal. On the third day we frequently had an inanition fever; there is decomposition of the child's own tissues for the production of heat energy. The question comes up whether this comes from the meconium and the secretions of the intestinal canal or whether it is parenteral. It is the consensus of opinion that indol is the result of decomposition of cleavage protein under the influence of bacteria. These changes may not be confined to the intestinal canal but may be found in other conditions as in pelvic abscesses, or empyema. Animal proteins are more prone to decompose and produce indol than vegetable proteins and there are also larger amounts of indican produced when there is retention of foods in the stomach. These are the cases in which one finds a chronic putrefactive decomposition, and looked at from that standpoint, it is simply a phase of intestinal indigestion.

As has been said there may be a variety of toxins produced, and the question comes up whether the indicanuria is due to toxins purely or whether it is due to reflex irritation. Some of the worst cases of indicanuria I have seen have been after epileptic convulsions or profound nervous disturbances. In these cases is the indicanuria due to putrefactive changes in the intestinal canal? I will not pretend to answer. Some cases of indicanuria are acute and some long continued, but overfeeding with the proteins and lack of exercise, infections of the gastrointestinal canal and defects of the digestive enzymes seem to be the underlying causes.

I would also emphasize the family predisposition of which Dr. Carr has spoken and in addition the influence of profound nervous disturbance.

Dr. Florence I. Staunton, of Utica.—Most children with an acute attack of indicanuria show such bad symptoms and it is so easy to cure them that as is the case in scurvy, we get very brilliant results where no special credit may be due. It is a good idea when called to see a case in which you suspect indicanuria as a result of overfeeding, not to tell the parents that the child has been overfed, as many parents resent being told this, but to take a specimen of urine and after having made the examination to lay the evidence before the parents. One is more likely to get their coöperation in this way.

Dr. A. L. Benedict, of Buffalo.—With regard to the parenteric source of the indican, I am rather skeptical. Where we find a decomposition of surgical products, as in mastoid disease, or appendiceal inflammation, we do not get indican in the urine.

As to the familial tendency, where we see this peculiarity running through a family, we cannot be sure that it is a family tendency for it may be due to a common fault in diet. Until a few years ago I found indican very frequently, but during the past year I have found it very rarely. I thought at first that this might be accounted for by my reagents, but the tests showed nothing wrong with the reagents. The finding of fewer cases may be due to economic conditions and to the fact that people are eating less meat than formerly.

Dr. J. R. Wiseman, of Syracuse.—The appearance of indican in the urine is only an indication of something abnormal, but I do not believe that *per se* it is a symptoms of great moment. I cannot subscribe to the statement that advanced arteriosclerosis originates in indicanuria. In a number of cases of cardiovascular disease tested for indican I have been surprised to find the chloroform as white as in the urine of young babies. I have seldom found indican in these advanced cases. The finding of indican indicates that the patient should be treated, but I think its importance has been very much exaggerated.

I have found that the average specimen of urine shows more indican in the summer time than in winter; whether this is due to the greater amount of putrefaction going on in the hot weather is a question which needs more study. Personally I do not believe that heart and kidney disease may be traced to intestinal putrefaction alone, but that there are a number of other causes at work.

DR. ABRAHAM JACOBI, of New York.—We have heard much about indican and I cannot add much to it. In regard to finding more indican in the urine in the summer than in the winter, this may be accounted for by the fact that the digestion is much less active in the summer than in the winter in both infants and adults. Both children and adults eat too much in hot weather. I believe that indican is in forty-nine out of fifty cases the result of indigestion. You have been feeding too much meat and also too much milk. In pure milk feeding there is not as much danger as in meat feeding. I never give whole milk to infants or children and I believe I may not have seen so much indican as some of you. Where I see indican it is the result of indigestion and therefore these patients get well rapidly if they are starved or the diet changed.

DR. FENTON B. TURCK, New York, presented a paper entitled

THE MECHANISM OF INTESTINAL ATONY IN CHILDREN; ETIOLOGY AND TREATMENT.

While the mechanism of intestinal atony in children is initiated by the same causes and follows a similar series of events in the child as in the adult, there are certain factors which make the child more susceptible than the adult to gastrointestinal disturbances. In considering the etiology of intestinal atony we must recognize the rôle of the physics of colloids in biology. We must remember that the lumen of the intestine acts as a membrane filter for colloids and is at the same time itself colloidal in character. In the production of intestinal atony there are a number of factors involved as: 1. Increased permeability of the gastrointestinal tract. 2. Agencies which are responsible for this increased permeability. 3. A previous sensitization of the muscle cells, rendering them susceptible to anaphylactic reaction. 4. Fatigue. 5. Tension. Other pathological states may also exert an influence.

The passage of bacteria and other proteins has been shown to be definitely influenced by changes in the splanchnic, circulation, overfeeding, fatigue, shock, tension, etc. In the new-born and to a lesser degree in young children, we have a different condition from that found in the normal healthy adult; this is that there is no barrier to the passage of the bacteria, since a wall impervious to the passage of bacteria has not yet been formed. Antibodies have not yet been generated because they have not yet been needed. In the course of our experiments we demonstrated that bacteria fed to the mother may show their effect on the offspring. Colon bacilli fed to the mother have been recovered from the fetus. We have been able to show the rate of bacteria diffusion and the routes by which diffusion occurs. The route taken by the bacteria is always between the glands and cells and never through them; neither do the bacteria enter the blood-vessels or lymphatics, but they pass by the way of the muscular mucosa. Bacteria injected at different sites take different routes, some going to the liver, some to the kidneys, some to the pyloric region, according to the site of the injection.

Agencies that facilitate bacterial diffusion are the exanthema, meat extractives and fatty acids, and all conditions that lower the tone of the muscular wall of the intestines. Experiments on mice and rats fed on meat extractives show that the bacteria pass into the submucous tissue more rapidly than in control animals. Monkeys fed on fatty acids in addition to their ordinary diet all died within four to six weeks. Postmortem examination of the viscera of these animals showed fatty infiltration, especially in the liver and also marked congestion of the splanchnic vessels. The histological examination shows migration of the bacteria into the submucous tissues at various levels of the intestinal tract. Autolysis of the tissue cells was also demonstrated with the usual picture of acidosis. These experiments show the deleterious effects of feeding high fat percentages to infants and furnish a rational basis for feeding albumin milk in cases of gastrointestinal disturbance with acidosis.

As a basis for or predisposing factor favoring bacterial invasion we may have a hypersensitive condition of the muscle cells caused either by some foreign protein absorbed from the lumen of the intestinal tract. This hypersensitiveness of the cells may be transmitted from mother to fetus and we then have a passive anaphylaxis. When the hypersensitive state is present and we have superimposed an exciting cause, as invasion of bacteria, a spastic or flaccid state of the muscle cells is produced as the result of anaphylactic reaction. The muscle cell contact rhythmically independently of the nerve supply until they are weakened by a faulty blood supply or fatigue, hence the processes we are considering are carried on independently of the central nervous system. Tension is an important factor in initiating splanchnic congestion and atony. In a state of tension there are alterations in the musculature of both the viscera and the veins. Ferment due to microörganisms producing gases may also be responsible for tension and latent fatigue. Carbohydrate overfeeding may play a part in the production of these bacterial ferments and may sometimes be the exciting factor setting up the whole group of symptoms, fatigue, splanchnic congestion, bacterial invasion, anaphylaxis, asphyxia of the muscle cells and acidosis. Cyclic vomiting with acidosis may be explained on the theory of the accumulation of the intestinal flora, due to a combination of several of the factors we have considered, until a point is reached at which an explosion occurs. We witness a similar phenomenon in other infections, as the periodicity of the rise in temperature in typhoid fever, tuberculosis and malaria.

Treatment must be physiological, pathological, symptomatological and bacteriological. In the treatment of severe acute cases where death seems to be impending, the first indication is heat stimulation and gastric and colonic lavage with bicarbonate solution 110 to 118° F. Other measures are starvation, the avoidance of milk, the subcutaneous injection of salt or sugar solution, transfusion and the subcutaneous injection of autogenous blood serum. When feeding is resumed cornstarch gruel had proved satisfactory. Meat extractives and fatty acids should be avoided and the length of time between feedings prolonged. The chronic cases are treated along the same lines though somewhat less drastically. These chronic cases are the ones which offer an appropriate field for the use of the autogenous vaccines, made up according to a method which I will describe, and from cultures taken from the stomach, the urine and the cecum. Illustrative cases are cited showing the effect of the combined method of treatment and the importance of the vaccine treatment.

Second Day April 25, 1917.

Dr. Henry L. K. Shaw read a paper on

PERTUSSIS VACCINES.

Statistics prove that in young children whooping-cough is the most fatal of the group of so-called infectious diseases of childhood. Fully 80 per cent. of the deaths from whooping-cough in New York State during the five-year period, 1910 to 1914 were of infants under two years of age, and ninety-six of the whooping-cough deaths were among children under five years of age. The importance of controlling and preventing a disease which has such a high mortality in early life, and such a long and often protracted course, leaving the child debilitated and susceptible to bronchopneumonia, tuberculosis and diarrheal disease, cannot be too strongly emphasized. The most rational and important step in the control of whooping-cough is the prevention of the disease itself. The very great importance of an early recognition and prompt reporting to the health authorities of whooping-cough should be realized both by the general public and the medical profession. Every cough should be regarded as suspicious until its real nature is ascertained, and while in doubt the child should not be allowed to associate with other children. Penalties prescribed by the Sanitary Code for failure to report cases of whooping-cough should be enforced just as rigidly as in the case of infantile paralysis, diphtheria and smallpox. Infected children should be isolated from other children and if they appear on the street should wear a distinguishing mark, such as an arm-band with the words "whooping-cough" in large letters. The sputum and vomitus should be treated in the same manner as in tuberculous affections. The fact that there are 999 alleged "sure cures" for whooping-cough is proof that we have not yet found a medical remedy of much value. The discovery of the Bordet-Gengou organism has opened the way for a more rational and scientific mode of treatment. Pertussis vaccines are prepared by several commercial houses, by the New York City Department of Health, and in the laboratories of the State Department of Health. Those prepared and recommended by the commercial houses are polyvalent, that is they are mixtures of vaccines, not only containing the Bordet-Genou bacillus, but containing the influenza bacilli, staphylococci, streptococci, etc. The vaccines prepared by the New York City and State Department of Health are pure vaccines, standardized by Wright's method from the Bordet-Gengou bacillus. In influenza Dr. Holt has shown that we may find a cough which clinically resembles that of whooping-cough, so that in these cases the pertussis vaccines would have no effect. There is also a probability that there are several types of the Bordet-Gengou bacillus. These facts should be borne in mind before condemning the use of vaccines which prove unsatisfactory in a small series of cases. Graham and Hess report experiences with the pertussis vaccines which they believe warrant their further trial. At St. Margaret's House in Albany of 164 children exposed to whooping-cough in four different epidemics and only 7 per cent. of the number developed the disease. The vaccines administered were from pure cultures prepared by the State laboratory. In former days when whooping-cough developed in an institution, at least 50 per cent. of the inmates contracted the disease. The value of the vaccines as a prophylactic measure is undeniable, and they should be administered to every child exposed to whooping-cough. The vaccines are harmless, do not produce severe reactions, and there is no danger of anaphylaxis. The dosage used for prophylaxis at St. Margaret's House is the same as for treatment, namely, five hundred million, first injection, one billion for the second, two billion for the third, giving the injections every second or third day. We have administered with good results one billion every two days for ten days.

The results of the vaccines in the treatment of cases already in the paroxysmal stage are not as striking as in prophylaxis but the consensus of opinion of those who have employed the vaccines is that where the proper vaccines are used there is a shortening of the paroxysmal stage, with a reduction in the number and severity of the paroxysm. A study of the use of vaccines in 212 cases of whooping-cough in which this was the only treatment employed, shows that in 38 per cent. of the cases in which the vaccines were given after the whoop developed, the course of the disease was shorter than the usual duration of the whooping stage, but with no effect on the number and severity of the paroxysms; in fifty-two there were fewer paroxysms and of less severity. In 12 per cent. of the cases there was no improvement observed, either in the course of the disease, its severity or the number of paroxysms. The Laboratory of the State Department of Health is ready to furnish vaccines which are prepared from pure cultures of the Bordet-Gengou bacillus. These may be obtained by health officers in packages containing three individual, graduated doses or in small vials containing 10 c.c. The administration of the vaccines is recommended for all children who are exposed to the disease.

DISCUSSION.

Dr. Frederick M. Meader, of Albany.—I am not in active practice but in my talk with physicians I have been very much impressed with the results that have been obtained with the vaccines. The consensus of opinion is that the vaccines have considerable value as a prophylactic measure.

There is a question as to how long the immunity lasts, but apparently from our experience it does not last a long while, possibly not more than two or three weeks. It should be used prophylactically through an outbreak of whooping-cough and has to be repeated with every fresh outbreak of the disease. We are getting better results than when we first used the vaccines because we are giving larger doses. We at first gave only fifty to one hundred million, whereas we are now giving from five hundred to one thousand million every day or every other day for ten days. In the treatment of the disease it seems apparent that better results are obtained where large doses are given. There is evidence showing that there may be a difference in the strains of the Bordet-Gengou bacilli and that it may be advisable to prepare vaccines from cases in the same locality in which the vaccine is to be used.

In regard to getting the organisms for the vaccines, it is sometimes difficult to obtain them, one either cannot find the organisms or if he does find them cannot make them grow. In order to get them one should make the child cough and get the thick, tenacious material coughed up. This should be placed on a slide and then another slide covered over it. In this way the organisms may be more readily isolated.

From the examinations we have made our impression is that cases of whooping-cough are not infectious for a very long time, and that during the later stages of the disease it is not infectious. It is possible that our period of isolation is too long, but I cannot speak definitely on this point at the present time.

Dr. H. L. Abrahamson, of New York.—I would like to emphasize the highly contagious character of whooping-cough. We have had an experience in the lower East Side of New York where we have had a perfect bee-hive of whooping-cough. Twenty-five per cent. of all the cases reported came from four square blocks. I have been studying the atypical cases of whooping-cough. In the Hebrew Orphan Asylum three children developed a cough atypical in character which continued for three weeks before they began to whoop and before they were isolated. An outbreak followed and the vaccines were used in the treatment of our cases. We thought the duration of the disease was shortened and the paroxysms less severe under this form of treatment. We gave a dosage high enough to produce a local reaction but tried to avoid a systemic reaction. We gave about two hundred and fifty million killed bacteria. We gave twenty-five billion to one man, twenty-five years of age, who had typical paroxysms. We have also found that some strains of the vaccines are effective and some are not.

Dr. Williams has been working on this subject in the Laboratory of the Department of Health and has given out vaccines labelled A, B, and C, and we are working with them to try to find their value.

Getting the organisms is not easy; we use a spatula and make the child cough.

In using the vaccines, we find that there is usually a response after two or three injections, if they are going to be of benefit. Some cases never improve under the vaccine treatment no matter how much vaccine is given them. Other cases again have been going on for months, and after having been given one injection of the vaccines, have been improved and the cough has stopped. We may say that the vaccines are of considerable value in chronic cases.

Dr. W. Wooden, of Rochester.—In my work with Dr. Goler in Rochester, I have talked with mothers and they tell me that the children that have received the vaccines prophylactically do not have the disease as badly as others of their children who did not have these vaccines. We feel thoroughly convinced that if children do contract the disease after having received the vaccines the attack is milder than it otherwise would be. In treating the disease I have given one boy of six years six doses, seven billion in all, and had a very good result.

Dr. T. Wood Clarke, of Utica.—I am thoroughly convinced as to the value of the vaccines, but I would like to ask if anyone knows how long the immunity is going to last. From what we have heard it seems that this point is not definitely settled.

Dr. Henry L. K. Shaw, of Albany, in closing.—I began to use these vaccines with a great deal of skepticism. A representative physician succeeded in making me promise to give them a trial and after the first trial during an epidemic of whooping-cough I was convinced of their value as a prophylactic measure.

I do not think we know anything about how long the immunity lasts, but we think it is of brief duration. We now take no chances with whooping-cough. If a baby develops the disease, we vaccinate all the others in the institution. Before we used prophylactic vaccination about 80 per cent. of the children would come down with the disease during an epidemic but since using it only about 7 per cent. contract the disease. The mortality has also fallen and we no longer dread the disease as we formerly did. The vaccines are not a perfect cure, but at the present time they are the best remedy we have.

DR. FRITZ BRADLEY TALBOT, Boston read a paper entitled

RÖLE OF FOOD IDIOSYNCRASIES IN PRACTICE.

Active anaphylaxis results when a foreign protein is injected in small amounts into an animal at intervals of at least nine to fourteen days. After the first injection there is no visibile reaction. The second injection, however, is followed immediately by characteristic symptoms, which are often severe and may even result in death.

Passive anaphylaxis develops within a normal animal within a few hours after the injection of the serum of a sensitized animal of the same species. An animal may transmit to her offspring, during pregnancy, any sensitiveness present in her. Antianaphylaxis occurs for a short period after anaphylactic shock. During this period an animal will not react to the protein to which it has been sensitized. Immunity follows repeated injections of foreign protein at short intervals (three to four days).

Acquired sensitization is comparable to active anaphylaxis in the animal. Hereditary sensitization is comparable to passive anaphylaxis in the animal, but differs in that it may be transmitted from the paternal as well as the maternal side of the family. The writer has been able to trace a definite history of sensitization through three generations in several instances, and in twenty-nine out of thirty-six cases studied there was a definite family history of of either asthma, hay fever, or eczema. The skin test has been described in a previous article. It has been found more satisfactory to use a linear incision in preference to the round von Pirquet scarification.

The intradermal test, made by injecting 0.02 c.c. of the foreign protein to be tested into the layers of the skin is the most sensitive of all skin tests but is harder to interpret than the scarification test. The intradermal skin test has many disadvantages in children. The materials which may be tested to determine food idiosyncrasy include the proteins of animals, fish, milk, eggs, grains, vegetables, fruits, nuts, bacterial proteins and pollens. In many instances the fresh raw material may be used as in egg white or beef juice. Pure soluble proteins have been prepared from the various food proteins.

The differential count of the blood in asthma, hay fever and eczema, is characterized by an eosinophilia. Schloss has shown that in animals an eosinophilia appears after the subcutaneous injection of a foreign protein, and in infants after taking a foreign protein for the first time. This reaction comes at a time when sensitization is developing. It seems probable that all diseases with a pronounced eosinophilia will eventually be connected with anaphylaxis. The symptoms of anaphylaxis may be connected with the eyes, the nose and respiratory tract, the alimentary tract, or there may be cutaneous or general symptoms. Croup may in some instances be due to anaphylaxis. Chronic bronchitis, when afebrile and not due to bacterial infection, may be due to food. After ruling out cardiac, renal and thymic asthma, and asthma due to bronchial glands, their remains bronchial asthma, or better asthma due to anaphylaxis.

This form of asthma may be of three types, inspired type, ingested type and bacterial type. Thirty-six cases studied with reference to their reaction to a large number of foreign proteins, animal, vegetable, and cereal have been tabulated. Although eggs are shown to be the commonest cause of asthma in childhood, other foods may bring it on even when eggs have been entirely excluded from the diet. When a child reacts to one article of food it is apt to react also to all the other members of that particular botanical group. This tendency to group reactions is very striking in some cases and gives valuable information as to treatment. Group reactions are, however, by no means the rule, and it is necessary to test all the proteins before it can be said that a case has been thoroughly investigated. There is also a biological similarity as well as difference between products of the same animal. For example, an individual may react to both milk and beef serum, but more often when milk was positive the serum was negative, or *vice versa*. The symptoms arising from the alimentary tract after the injection of a foreign protein, such as swelling of the lips, tongue, mucous membrane of the mouth and pharynx, were intimately related to one another and depended upon the amount of mechanical obstruction caused by the local reaction. The cutaneous symptoms secondary to anaphylaxis included such conditions as urticaria, and cases of angioneurotic edema. Up to date the writer has not been able to establish any connection between these diseases and foods by means of the skin tests, and it is possible that some other method of diagnosis would have to be devised. Eczemas, on the other hand had been shown in many instances to be connected with food sensitization.

Eczema might be divided into two classes, that in the nursling and that in the older child. The nursling was in nearly all instances sensitive to cow's milk, but the data on this subject was insufficient to warrant taking an infant entirely off of cow's milk and feeding some synthetic food. There was much evidence to show that the mother's diet has a marked influence on the nursing baby's skin. Sixty-seven different skin tests for food proteins were made without a single positive reaction except rice that could in any way connect the food with eczema in older children. Arthralgia might possibly in a small group of individuals be due to food. It was possible also that some of the diseases attributed to uric acid will eventually prove to be some form of allergy.

Although there is sufficient proof to place all symptoms and diseases mentioned above among those which may be due to anaphylaxis, it should be emphasized that such symptom is only of anaphylactic origin in a small group of cases. They should only be attributed to allergy when in each case they are proven to have no other origin, and when a specific skin test to a food protein is obtained. With the withdrawal of the foreign protein the symptoms should disappear and return again only when the offending protein is again given.

DISCUSSION.

Dr. Talbot has mentioned a number of food substances that have been found to produce reactions, but I do not recall that he has mentioned lamb. I met an instance in which a man had an idiosyncracy for lamb which was thought to be merely a whim. On one occasion when dining with a friend and not wishing to appear peculiar he ate lamb and in a few minutes became so ill that he fainted at the table.

Dr. Talbot speaks of family heredity and of the possibility of these food idiosyncrasies being handed down for several generations. I think as we go on we will find more of these cases. At the present time I am working on the tendency of certain families to show an idiosyncrasy in reference to an inability to digest the fat of cow's milk. I have found that in cases in which a child shows an inability to digest the fat of cow's milk, one or other of the parents have been unable to take milk, not in the sense that they have an anaphylaxis, but it will cause digestive disturbance, constipation and biliousness, so we see these tendencies handed down and they may be found in respect to other things than those which Dr. Talbot and I have mentioned.

Dr. Louis Faugeres Bishop of New York.—Dr. Talbot is to be congratulated in that he has kept within bound and not allowed his imagination work in a field where the imagination is often too active.

There is one phase of this question of anaphylaxis which I would like to mention in connection with arteriosclerosis. The question of egg is of the greatest importance in older people suffering from cardiovascular disease. I can state from my experience that I have seen people who appeared to be about to die from arteriosclerosis and who when eggs were withdrawn from their diet have recovered and gone on comfortably for a time. The whole question is one of dietetics. A diet to be of any use must be an absolute diet. I have been interested in the low protein diet and in the caloric method of feeding but I did not get any particularly striking results with these methods in the treatment of chronic disease until I approached the problem from the standpoint of the particular protein.

One of the most suggestive points that Dr. Talbot has brought out is that some of the diseases attributed to uric acid may be due to food allergy. Many things that have been blamed on uric acid are in reality due to food idiosyncrasy.

A point that needs more emphasis is that there are food idiosyncrasies that do not produce evident symptoms and the way to find out whether the food is to blame is to absolutely withdraw food and then observe whether the patient gets better or not.

Dr. William J. Schuyler of Syracuse.—I recall a child of seven or eight years who had an idiosyncrasy to strawberries. If he ate even one he always broke out with hives. His father, thinking it merely a whim, offered him a dollar if he would eat a certain number of strawberries. He managed to eat three and became so ill that he almost died. He only recovered after a great deal of effort on the part of the physician.

Dr. Conway A. Frost of Utica.—I have met a peculiar family idiosyncrasy to the odor of onions. In this instance the idiosyncrasy was not transmitted in the direct line but simply ran along through the family.

Dr. Fritz B. Talbot of Boston.—I use the toothpicks in order to be sure of keeping the different proteins separate. I use them just as they come and do not sterilize them. I use a very small incision and the skin is not broken so as to draw blood. I have never seen a patient infected as the result of doing this skin test. I wash the arm off with alcohol before the incision is made and after the protein has been put in.

Dr. Southworth's remarks are particularly interesting to me as I have been studying the fats; there seems to be some connection between fats and anaphylaxis. All I can say at the present time is that in cases of anaphylaxis in which we see urticaria, eczema, and hay fever, there is more fat excreted in the stools than under normal conditions.

In regard to Dr. Bishop's remarks, I feel that we should not confuse the two conditions, anaphylaxis and arteriosclerosis. A food disagreeing is not necessarily anaphylaxis. I do not say that a patient has an idiosyncrasy to a certain food until I have proved it. The only way to prove that the patient is sensitized is by giving the different proteins, and by finding that the patient recovers when the protein to which we believe he is sensitized is withdrawn and the reaction disappears. Without this sequence of events I do not think it is fair to say that a given condition is due to protein. One of the inconsistencies of considering that anaphylaxis has anything to do with arteriosclerosis is that anaphylaxis is not characterized by high blood pressure, but by low blood pressure.

In regard to Dr. Schuyler's case of idiosyncrasy to strawberries, strawberries are a very common cause of anaphylaxis.

Dr. Frost's observations about a family in which there was an idiosyncrasy to the odor of onions is interesting. I know of an instance in which asthma is brought on in an adult by smelling a peach and another in which hay fever is caused by merely going into a room where there are primroses.

We must not draw conclusions without the skin proof and the proof is the skin test.

Dr. Wardner D. Ayer, Syracuse, read a paper on

THE EARLY DIAGNOSIS OF POLIOMYELITIS.

In the epidemic of last summer I was appointed diagnostician by the State Health Department and was appointed to the sanitary district which includes Oswego, Onondaga, Cortland, Seneca and Cayuga counties. In the city of Syracuse 228 cases of poliomyelitis were reported, while in the outlying districts 270 cases were reported.

Of these 498 cases I saw 102 in the acute stages. In eighty-eight of these the diagnosis was confirmed by lumbar puncture; in forty-two it was proven by subsequent development of paralyses; fifty-eight cleared up without apparent paralyses and were considered abortive cases. Twenty of these nonparalytic cases received one or more injections of serum, which in several instances I feel sure influenced the course of the disease. Seventeen cases died. The three cardinal symptoms were fever, headache and rigidity of the neck. Accompanying these but less constantly observed are tremor, drowsiness, constipation, retention of urine, sweating, and various hyperesthesiæ. These symptoms could be best explained on the basis of the probable pathological mechanics of the infection. In the abortive forms of the disease the inflammatory reaction is limited to the meninges, it subsides there without further extension and consequently no paralyses result. But in the more severe forms there is a subsequent involvement of the substance of the cord with intramedullary changes. The theory of the hematogenous mode of infection is in my opinion entirely inconsistent with the fluid findings and the clinical aspects of the disease. It seems to me that in poliomyelitis we are in many respects dealing with a local disease, one in which we first have a meningitis, where the disease may often subside, giving us the abortive or nonparalytic type; but by further direct extension along the perivascular lymph spaces, it may give rise to the cortical lesions with resultant paralyses.

In the 102 cases studied by the author often only a single observation could be made, hence a consistent analysis was difficult. Fever was present in every case, the average duration being 80 hours. The onset was usually abrupt. The average temperature observed was 102.2° F. Headache was noted in all but one of these cases. It was general in character and very resistant to treatment. Rigidity of the neck was found in 97 per cent. and was quite characteristic. It was rarely similar to the rigidity of meningitis which was most often a retraction. Retraction was only seen in two cases. The rigidity was an anterioposterior one and might easily escape detection. Drowsiness was present in 87.4 per cent. of the cases. The mentality was always clear. Tremor and muscular twitching was present in 60.7 per cent.; vomiting in 40.1 per cent.; constipation in 36 per cent.; difficulty in urination in 56.8 per cent.; sweating in 21.5 per cent. No distinctive disturbances of the reflexes were observed. In 12 early cases they were exaggerated. Kernig's sign was not constant, being observed in only 18 instances. Indefinite pain, redness of the throat and heavily coated tongue were common findings. Lumbar puncture is without doubt our most reliable and valuable aid in the recognition of poliomyelitis. The spinal fluid in the early stage of the disease is quite characteristic. The spinal fluid is more often clear, and increased in amount, very often there is a slight opalescence, and in a few instances a distinct turbidity. In these fluids which are cloudy, a cloudy web formation was seen on standing. There is a distinct increase in the cellular elements. The character and number of the cellular elements depends a great deal upon the time the puncture is performed. The polymorphonuclear leukocyte often predominates during the first twenty-four hours, and the cells are usually found in the greatest numbers at this time. These are rapidly replaced by lymphocytes, so that this is the cell more commonly observed later. Of the 88 fluids examined, 44 were apparently clear, 37 presented slight degrees of cloudiness or opalescence, and 7 were distinctly cloudy and turbid, closely simulating the fluid of a suppurative meningitis. The fluid that appeared clear to the naked eye never showed more than 300 cells to the cubic millimeter. The opalescent fluids showed 300 to 900, and the turbid or cloudy fluids all showed counts of over 1000. The average count for all cases was 420 cells to the cubic millimeter, the lowest being 65 while the highest was 1230. No cell count was observed in any case without the accompanying clinical evidence of meningeal irritation. After several negative findings in suspected cases we advised against lumbar puncture in suspected cases until more definite symptoms such as headache, rigidity of the neck, or muscular twitchings appeared. Increased pressure of varying degrees was seen in 70 of these cases. The chemical examination of the fluids were not of great importance except as confirmatory evidence. Specimens are characterized by the presence of an increased globulin content and increased albumin which was estimated by nitric acid stratification. The cells rapidly disappeared from the fluid with the subsidence of the temperature. The cases with the higher cell counts were, not always, but usually the more severe. The conditions coming up for differential diagnosis and simulating poliomyelitis were abscess of the brain, suppurative meningitis, influenzal meningitis, tetanus, typhoid fever with meningismus, chorea, acute articular rheumatism and hysteria. Of the 42 cases developing paralysis, 11 were the true bulbar type, 10 of whom died of respiratory paralysis. Of the 30 remaining cases, 14 showed paralysis of an entire extremity or more, with 5 deaths. Six cases developed facial paralysis and 10 showed partial or slight involvement of an upper or lower extremity.

DISCUSSION.

Dr. Harry L. Abramson, of New York, said: There is a type of case that is puzzling to the physician both early and late, and in which even with the aid of the spinal fluid examination one only makes a tentative diagnosis. This is the type which resembles tuberculous meningitis, in the length and the course and the general clinical features of the disease. These cases sometimes exhibit general clinic convulsions, exaggerated knee-jerks and other symptoms of cortical irritation in the motor areas. Other cases present prolonged stupor, exaggerated knee-jerks, and an occasional convulsion. The spinal fluids in these cases are very much as one would find in tuberculous meningitis. Another cerebral type is one that presents all the clinical features of hemiplegia. At autopsy in one such case, I found the right motor area and parietal region reduced to a mushy consistency. The spinal fluid findings were such as are found in poliomyelitis and also in lues. However, the Wassermann was negative and no history of lues was obtainable. Another type of case which may present difficulty is that which presents the classical symptoms of an acute purulent meningitis. Experience with acute meningitis has taught me that fluids from these cases are more turbid than those from poliomyelitis. It is our opinion at the Department of Health of New York City that the spinal fluid examination is of the greatest help in the diagnosis of the typical and non-paralytic types of poliomyelitis. But a diagnosis of poliomyelitis should not be made on the spinal fluid alone. Conditions which may yield a spinal fluid identical with that of poliomyelitis are typhus fever, luetic meningitis, whooping-cough when complicated by convulsions, epidemic cerebrospinal meningitis in the early and recovering stages, and tuberculous meningitis. However, the spinal fluid examination offers a ready means of excluding meningism accompanying the acute infections, such as pneumonia, scarlet fever, typhoid fever, gastroenteritis. In these conditions the spinal fluid shows absence of cells, albumin, and globulin. Dr. Ayers speaks of finding polynuclears quite frequently in the early stages. Our findings in a great number of fluids withdrawn early in the disease do not yield us such results. We do not believe that every spinal fluid passes through a polynuclear stage before the mononuclears appear. We are inclined to believe that the type of cell found indicates a type of reaction rather than a stage of the disease. The presence of the fibrin web has no differential diagnostic significance. Many pathological fluids from other sources present the web; it is simply an indication of the presence of fibrin-forming elements.

I regret to note that Dr. Ayer has neglected the chemical examination of the spinal fluids. These are quite as important as the cell count. There are some fluids in poliomyelitis which show the presence of albumin and globulin and no cells. It seems to be the tendency of some physicians to overemphasize the importance of cell counting in the examination of the spinal fluids. Much valuable information can be gained from the proper performance of the chemical tests.

Dr. Elias H. Bartley, Brooklyn, read a paper on

DEFECTIVE NUTRITION IN EARLY LIFE.

It has been estimated that approximately 10 per cent. of the children in the schools of our large cities suffer from malnutrition. Many, if not most cases of malnutrition, develop in early life, that is before the sixth year. Some of these cases of malnutrition are certainly hereditary while others are as certainly developed by unfortunate surroundings, disease or accident. Many of these underfed, mostly neurotic or neurasthenic children, are injured during infancy or early childhood by faulty feeding, by acute infections, tonsillar infection, or acute gastroenteric infections. These children are regarded as delicate and are therefore nursed, pampered and indulged. Much can be done for these children if efforts are begun early. It is the up-to-date family physician and not the specialist, who can make good citizens of the class of children we are discussing. He is in a position to follow up the supervision of the family which is essential to obtain results. By the time the child reaches the age of six or seven years the chance of changing the general health grows rapidly less. The first necessity is to obtain a complete history of both child and parents, the home life, disposition, characteristics, and habits. The confidence and coöperation of the parents must be established if results are to be obtained. Directions as to the resulation of the lives of these children should include habits of exercise, rest play, sleep, entertainment, diet, the care of the mouth, nose and throat. These children while they cannot always be submitted to the hardening process should not be pampered and overindulged but should be allowed as much liberty of action as their health will permit. They should have range enough to permit them to develop, with just enough oversight to protect them from bodily harm. There should be long and systematic hours of sleep and the avoidance of exciting entertainment. In the management of these physically defective children we should carefully inspect and treat or have corrected any source of infection in the mouth, nose, or throat. In the management of nutritional disorders in childhood the chief difficulties we have to contend with are: 1. The prejudice and preconceived ideas of the mother or nurse. 2. The previous habits and prejudices of the child. 3. Lack of appetite or digestion of the child. 4. Willingness of the child to assist. Milk should be continued in some form after weaning. Most of these children discard fats and no effort is made to correct this vice. Fat is essential to the well-being of all growing children. It can be most readily supplied by milk, butter, bacon, and gravies. Butter is a great assistance in the treatment of all cases of malnutrition in the second year and later. Sometimes the abstinence from fats is an early symptom of tuberculosis. Sugar in these cases should be eaten with meals unless it is found to produce acid fermentation. The toleration of sugar must be studied in each case; when well tolerated it acts to protect the fats and proteins to a large degree and it promotes the retention of water which is desirable. There should be a balance in acid forming and alkali forming foods. In general the meats, eggs, cereals, including rice, are acid forming foods. The fruits, green vegetables, milk, potato, legumes, are alkali-forming foods. The antiscorbutic foods and the vitamines must not be neglected. There should not be a too free use of soups in young children.

THE DIFFERENTIAL DIAGNOSIS OF ENLARGEMENTS OF THE CERVICAL LYMPH NODES.

DR. ROYAL STORRS HAYNES.—Enlargement of the cervical lymph nodes may be regarded in general as falling into three classes of (*a*) inflammations, simple or tuberculous, (*b*) hyperplasias, and (*c*) neoplasms, bearing in mind that these pathological processes do not adhere with consistency to particular disease entities. As types of neoplasms, the least common are lymphadenoma, lymphosarcoma as primary diseases and carcinoma as a secondary process. The commonest forms of enlargement of the cervical lymph nodes are the infections, enlargements secondary to bacterial invasion of structures of the head and throat whose lymphatic drainage terminates in one or other of the groups of lymph nodes situated in the superficial and in the deep structures of the neck. It is these enlargements which are of the greatest importance from the standpoint of etiology, diagnosis, and treatment. Enlargements of the cervical lymph nodes other than those due to infections are usually accompanied by signs of disease elsewhere which serve to establish a diagnosis even if the enlargements *per se* cannot be differentiated. Given an enlargement of the lymph nodes of the neck, the location of the lymph node group first enlarged will give valuable information as to the localization of the primary focus and some information as to the type of infection. Later no such definiteness can be claimed for the anastomosis between deep and superficial groups and between both sets of the deep group are so abundant that a widespread enlargement may be due to a small focus. An adenitis in a child under two years of age is likely to be a simple rather than a tuberculous affair; over two years of age to be tuberculous rather than simple. However, in making a diagnosis one should always lean to the graver alternative. If no raw milk or milk from tuberculous cows had been given the child, this point would be of value in determining the diagnosis. Similarly with reference to personal and social hygiene and contact with tuberculous individuals. The onset of swelling is important; tuberculous adenitis may be, but rarely is, acute in its onset. An onset with considerable abruptness, with fever, rapid swelling of the lymph nodes, tenderness, edema, and matting together, spoke for pyogenic infection. A slow increase of the swelling with gradual involvement of more than one node, with delayed cellular tissue infiltration, and delayed amalgamation of the skin and deeper structures spoke for tuberculosis. Yet in tuberculous cervical adenitis of early infancy just such a picture at onset as that described for acute pyogenic infection is likely to occur. Enlargement of cervical lymph nodes of over three months' duration are presumptively tuberculous. They may not be. Recurrent mild infections from adenoids may occur each attack leaving the lymph nodes with an increment of enlargement which does no allow of their resuming again their original size. The location of the nodes may be the same in both varieties of infection. When an enlargement is due to pyogenic infection there is likelihood of evidence in the mouth, throat, or nasopharynx of inflammation of the structures in these localities. The absence of such in the presence of cervical swelling is significant of tuberculosis. In the early stages less importance should be placed on the character of the swelling than upon the history, course and various examinations. Softening, if it occurs, will point and discharge, and subside if the process is pyogenic, while sinuses will persist if it be tuberculous. Examination of the blood should shows a polynucleosis in the pyogenic and a lymphocytosis in the tuberculous enlargements; but of course the later type may not be pure and secondary invaders lighting up an infectious process of a pyogenic nature on top of the tuberculosis will give a leucocytosis with polymorphonuclear increase in this type also. The anemia of the tuberculous type will probably be more profound. The tuberculosis complement fixation test should be positive in the tuberculous enlargement and negative in simple adenitis. It might nevertheless be positive in a simple adenitis when there were foci of infection elsewhere. The von Pirquet reaction if negative was valuable evidence of pyogenic infection. Röntgen ray examinations of the head if they disclose tooth abscesses, for instance, will be of help in placing the stamp of the pyogenic infection on a questionable enlargement. Similar examination of the thorax if it showed extensive tuberculous involvement would offer corroboration to a similar condition being present in the lymph glands and nodes. The evidence obtained from excised tonsils or adenoids might very often be inconclusive. Tubercle bacilli might be obtained from aspirated softened areas of the enlarged mass, or pyogenic organisms, or the pus might be sterile, an indication that the process is tuberculous. With all these aids you cannot make a positive diagnosis as to whether a gland is tuberculous until the gland itself is excised and examined. Hodgkin's disease may present a picture, which may be confusing, but here the constant progression of enlargement, without coalescing and without suppuration, the involvement of other groups of nodes, particularly within the thorax and abdomen, the splenic enlargement, the progressive anemia and the finding of characteristic Hodgkin's hyperplasia on section of a removed gland, would serve to establish the positive diagnosis. In lymphosarcoma we may have some similarity to Hodgkin's disease, but there is a tendency for the capsule of the node to rupture, the nodes to become adherent to each other and to the surrounding tissue. The course is rapid and the swelling may be very rapid. Acute lymphatic leukemia is the only form in which a cervical enlargement may need differentiating. In its early stage it presents enlargements of nodes up to the walnut size discrete, with little or no redness or tenderness. Later when hemorrhagic changes take place in the mouth and throat, infection is often superimposed on the picture. The diagnosis would be made by examination of the blood. Anemia with one to 3,000,000 red blood corpuscles, hemoglobin 20 to 30 per cent., leucocytes 60,000 to 150,000, of which 90 to 98 per cent. are lymphocytes, mostly of the large variety, are the expected findings.

DR. GEORGE BACON WOOD, read a paper on

THE RELATION OF THE NOSE AND THROAT TO CERVICAL ADENITIS.

Statistics or other absolute data concerning the relative importance of the nose, throat and mouth as the starting place for cervical adenitis are unavailable but I believe that about 90 per cent. of the cases of cervical adenopathy, if not more, have their original focus of infection within these organs. In the order of importance I would place the faucial tonsil first, next the pharyngeal tonsil and other lymphatic structures of the pharynx, including the lingual tonsil, the gums and alveolar processes, and, lastly, the nasal cavities and accessory sinuses. In all of these structures the point of infection may be more or less hidden. Lesions of other portions of the mucous membrane may occasionally give rise to adenitis. A study of the method of invasion by bacteria of the tonsil parenchyma in ordinary cases of acute tonsillitis shows the vulnerability of the cryptal epithelium. The most important glands of the neck so far as chronic adenopathy are concerned are the terminal, or deep glands which form a perpendicular chain beneath the mastoid muscle. Into this deep chain empty all the afferent collectors of the more superficial glands. These glands empty into each other terminating usually in a single large trunk called the jugular lymph trunk. A study of the anatomy of these chains of glands explains the mode of infection. The majority of cases of chronic cervical adenopathy are of the descending type. They usually begin with the enlargement of the tonsillar lymph node. The next most important group has its starting point in the upper glands of the external group of the deep cervical chain placed just behind the posterior border of the sternomastoid. The chronic form of adenitis rarely begins with the primary enlargement of the superficial chain. Practically the only afferent vessels running to the deep cervical chain come from some part of the upper digestive and respiratory apparatus, hence the importance of the mouth, nose and throat in the etiology of the cervical adenopathy. If the glands involved begin with those under the posterior portion of the sternomastoid muscle, we can rule out the tonsils and mouth in the large majority of these cases the infection comes through the pharyngeal tonsil. Alveolar infections involve primarily the posterior gland of the submaxillary group and where the tonsillar lymph node is primarily enlarged the infection must surely come through the faucial tonsil or the lingual tonsil, or possibly the lateral folds of the pharynx.

DR. THOMAS B. HARTZELL, Minneapolis, Minn., read a paper on

"CERVICAL LYMPHADENITIS DUE TO INFECTIONS ARISING IN AND ABOUT THE TEETH."

The facts regarding tuberculous, syphilitic and carcinomatous lymphatic invasion are well known to the medical profession, and the research in which we have been interested during the last five years has not thrown any additional light on these types of infection. We believe it is reasonable and logical to regard mouth infections as a result of the organisms which are habitually found in the mouth, which have the power to invade the tissues. This reduces our field of intensive study to a comparatively small number. The organisms which we believe deserve consideration are the fusiform bacillus, the mouth spirochæta, the Leptothrix buccalis, and the streptococcus. Our research work shows that of these the streptococci are the primary cause of the various dental infections. We regard the staphylococci as one of the active factors in acute alveolar abscess, but regard them as unimportant in the chronic alveolar abscess. We do not regard the staphylococcus as a factor of much importance in cervical lymph adenitis. The organism which is absolutely constant in the mouth is the streptococcus salivarius. We have found that the streptococcus viridans has the power of penetrating tissues and of causing metastatic lesions in all parts of the body. Unquestionable it produces atoxin, and in our opinion it is the organism par excellence responsible for most of the important dental lesions, including inflammation of the dental pulp. Certainly it is the chief causative factor in pyorrhea. This organism can and does invade the lymphatics and I have observed numerous instances of swollen lymph nodes in direct continuity with the lymphatic drainage from the gums and peridental tissues, which have rapidly receded as a result of stamping out of the growth of this organism in the tissues contiguous to the teeth. This organism creates a non-suppurative lesion in the beginning, which lesion may become suppurative as the destruction of the peridental tissues proceeds. The suppurative character of the pyorrhea process, however, is grafted upon the initial lesion produced by the streptococcus and is secondary to the streptococcal invasion. The chronic dental abscess, or so-called granuloma, is more important than the pyorrheal pocket as a focus of infection to the lymphatics and blood stream. From the clinical standpoint, the invasion of the cervical lymphatics by the streptococcus viridans presents a fairly constant picture of low-grade infection comprising swelling of the lymph nodes, very slight tenderness to pressure, with or without temperature, showing a narrow range. On account of the narrow range of temperature, streptococcus viridans lymphadenitis is often mistaken for incipient tuberculosis. There is no class of patients in which a careful examination of the mouth and jaws is of greater value than that of children. The removal of dead pulps of teeth and the curetment of abscesses has been observed to be followed by a decided increase in weight and vigor. In cases of this kind the extraction of the deciduous teeth is a safer plan than attempted sterilization. Sublingual gland infections from pyorrhea pockets and deep gingival crevices are exceedingly common, and frequently pass unrecognized. This is a very grave mistake because the great majority of metastatic infections of heart, kidney and joint might be prevented if patients were taught to attach importance to cervical gland enlargements and reported such conditions, thereby enabling the physician to eradicate the foci of infection causing them. Heart disease, according to statistics of the United States Government from the registration area, is a greater menace to life than tuberculosis. Heart disease is 90 per cent. streptococcal in its origin and to a large extent preventable, because its chief portal of entry is the teeth and the tonsils. If extraction of the teeth becomes necessary it should be done at intervals of five to seven days. The author has seen the last two years, four deaths as the result of wholesale extraction of teeth. The reason for these deaths lay in the fact that the circulation had reached a point of saturation with the toxins of the infecting organism. The granulating walls around the areas of inflammation were broken down and the patient was overwhelmed by a mass of living organisms thrown into the circulation by a too great amount of surgery undertaken at one time. The same thing is true of pyorrheal infection. I would advocate the same caution in the removal of the tonsils. It is vastly better to remove one at a time, if the patient is near the point of saturation with streptococcal toxins.

Dr. George E. Phaler, Philadelphia, read a paper on

X-RAY TREATMENT OF ENLARGED CERVICAL GLANDS.

The great frequency of cervical adenitis demands that more attention be given to this subject than has been done in the past few years. When a case is presented for treatment we should first search for the source of infection and if there is suspicion of disease in the tonsils, lymphatics, or teeth the focus of infection should be removed. If the glands are soft fluctuating or tender, at least the affected soft gland should be incised and drained. If the glands are not soft, and the case is of recent origin, or less than six months, in the majority of instances these glands can be made to disappear under the influence of the Röntgen rays, when properly administered. Whenever a child is operated upon for cervical adenitis, the operation should be followed by at least one or two full courses of postoperative treatment. This procedure will make many operations a success which would otherwise be a failure. If the gland is tender at the beginning of the *x*-ray treatment it will almost certainly become softened, red on the surface, and finally show signs of pointing. When this occurs it should be incised and treated as an abscess, continuing the *x*-ray treatment. In such instances a complete dissection of the glands of the neck will not be necessary, and as a result there will be a small and scarcely visible scar at the site of the incision. The hygienic conditions under which the patient is living should be improved as far as possible, and especially should the sources of infection be removed, that is of the source of infection is the milk of a tuberculous person. In general the technic of deep röntgenotherapy should be applied in cervical adenitis. My technic at present consists in the employment of hard rays thoroughly filtered that is to make use of rays from a tube which will back up a 9 inch parallel spark gap, which is equivalent to approximately nine on the Benoist scale. These rays are filtered through 6 millimeters of aluminum, and applied for 40 milliampere minutes through each portal of entry. The hair and face must be thoroughly protected by sheets of lead. The focal distance from the target to the skin is 8 inches. The number of portals of entry will vary somewhat in the individual case. In general two portals of entry for one side of the neck will be sufficient. In very severe cases four or more portals of entry may be necessary. I generally draw lines downward along the anterior border of the sternocleidomastoid muscles and then direct rays anteriorly through the neck, and then posterior to this line toward the deeper portions of these glands. This treatment is not repeated again for a month, at which time one usually finds a very decided reduction in the size of the glands. In not repeating inside of a month one avoids cumulative effects and a dermatitis. Dermatitis and even a redness of the skin should be avoided in treating these cases. If a severe dermatitis is produced there is danger of a subsequent development of a telangiectasis. Röntgen therapy should not be employed in these cases by an orderly or a nurse, but only by a skilled röntgenologist. There are to-day thousands of *x*-ray machines employed by incompetent men, men who may be competent in other lines of medicine, but who are wholly incompetent in röntgenology. Skilful röntgenology is as essential in these cases as skilful surgery.

Dr. Charles N. Dowd, New York, presented a paper on the

INDICATIONS FOR REMOVAL OF ENLARGED CERVICAL LYMPH GLANDS.

These indications hinge on the diagnosis of tuberculosis, for tuberculosis infection here gives the main indication for surgery. Hodgkin's disease and lymphosarcoma occasionally call for surgical interference. Hyperplastic inflammation seldom calls for surgery. If prompt diagnosis can be made in the tuberculosis cases, nearly all of them are curable by operation. Progressive tuberculosis of the cervical lymph nodes manifests itself in two main forms. In about 80 per cent. of the cases caseation and abscess formation result. When this stage is reached diagnosis is simple. Before the abscess is formed the enlarged lymph node just below the angle of the jaw has a characteristic appearance. It is usually much larger than the surrounding nodes, fairly soft, and is more or less attached under the anterior border of the sternomastoid muscle. In the remaining 20 per cent. the lymph nodes enlarge without abscess formation, and may extend throughout the neck from the mastoid to the clavicle, and from the internal jugular vein backward under the trapezius, and forward under the jaw. They are rather hard, not easily movable and matted together. They do not show as great a tendency to local limitation as do the caseating variety. Their tendency is to progress intermittently, and the patients who have enlarged upper cervical nodes of this variety in childhood may have them massed throughout the neck in adolescence or in early adult life. Hyperplastic nodes show a tendency to subside. If these factors are duly considered, the clinical differential diagnosis between tuberculosis and hyperplastic cervical lymph nodes can be made in almost every case. In a series of 726 cases which have been operated on by the writer or his assistants under his personal observation and which were tabulated, it might be seen that the earlier cases give wonderfully good results, and childhood is particularly the time for these favorable cases. If neglected they are capable of developing into the undesirable types of cases. Three considerations bear strongly upon the surgical problem. It is very important that there should be more adequate understanding of the real surgical problem. The practical considerations are: 1. Uncertainties in diagnosis. 2. Technicalities in operation. 3. Recurrences in late and unfavorable cases. The uncertainties cause two types of error. When tuberculosis is present and is unrecognized, the patients drift past the most favorable time for successful operation. On the other hand, when simple hyperplastic glands are wrongly supposed to be tuberculous, the particular form of treatment which is used for them is supposed to cure tuberculosis. This unfortunate confusion results. This confusion can be diminished by listening to the details given by Dr. Haynes, and also reviewed in this paper. The operation involves many technicalities. The simple incising of an abscess without discovering and removing the glands that lie back of it is particularly unfortunate. It is very common but should not be called an operation. The term operation should be reserved for the removal of the infected glands as well as the tuberculous detritus which comes from them. The technicalities of the operation should not be neglected. I have seen cases in which important nerves have been severed, as the facial and the spinal accessory before its entrance into the trapezius muscle. In addition to operative treatment three other kinds of treatment are often considered, first, constitutional; second, *x*-ray; third, tuberculin. After having studied all of them and having visited institutions where they are used and having seen the results, I can see no reason for advocating long periods of treatment which give uncertain results when there is a simple short treatment which gives such good results, except in these cases of diffuse tuberculosis for when radical removal is impossible or very difficult.

DISCUSSION.

DR. THOMAS S. SOUTHWORTH, of New York.—In the discussion of cervical glands of the neck the tendency is inevitable to revolve about the question of tuberculosis and its treatment. However, I wish to speak from the pediatric standpoint. It is important that the diagnosis of tuberculosis be made. Many conditions produce a physiologically similar condition but the majority of them can be traced, if sufficient care is exercised, to some lesion of the skin or mouth, near by the enlargement. The differentiation of the different types of glands is usually simple if they are studied, and if the diagnosis of tuberculosis is not too hastily made during the acute stage, a good deal of lay anxiety and mental uncertainty might be avoided. The differentiation between the subacute and chronic enlargements is much more difficult to make. Many young children have here and there palpable nodes, not very pronounced, the origin of which may be traced to some irritation which has occurred. The child may suffer from malnutrition, and lack of subcutaneous fat may make the nodes prominent. In cases of this kind the gland does not tend to increase in size. When glands continue to enlarge in spite of the removal of the tonsils, the adenitis is more serious.

With regard to the differentiation of acute suppurative adenitis which is present at times, and differs from the early picture shown by Dr. Dowd, it suggests suspicion of tuberculosis in the early stages. In infants acute enlargement may appear over night. In these cases there is nearly always a history of nasopharyngeal involvement, or a common cold, which is the source of the lesion. If fever persists, suppuration takes place within a week or two. From the standpoint of the pediatrician I have been at variance with the general surgeon in the treatment of these acute abscesses. The general surgeon freely opens such a lesion and packs it with gauze. The gland should be broken down before the incision is made. If fluctuation, pointing, and redness are present, the abscess should be incised for 3/8 inch, the skin stretched and the pus removed by gentle pressure and a small drainage tube put in. The contraction of these abscesses is rapid and leaves a minimal scarring. Such cases may be aborted by special attention to the nasopharynx so as to prevent further absorption. The older the child the more favorable the prognosis. The subsidence, as might be expected, is slow, and if it does not take place one may suspect a mixed tuberculous infection.

Dr. DeWitt H. Sherman, of Buffalo.—Tuberculosis is responsible for a large number of these glands that come to the surgeon. The acute non-tuberculous types are very often preceded by a history of a rapid rise and fall of temperature, lasting from one to four days, with a recovery. I have seen a number of this sort of cases, caused by infection of the pharyngeal tonsil. I have a chart showing a rise and fall of temperature of 6°, the highest point being 107. Many of these cases, having a severe adenitis get well, provided they do not fall into the hands of the surgeon. These children should be put under the care of a good nose and throat man, and then many would not come to gland involvement and subsequent operation.

Dr. Henry W. Frauenthal, of New York.—The discussion seems to be confined to the 7 per cent. admittedly tuberculosis cases of cervical glands. Of the other cases 75 per cent. were stated to be staphylococcus infections and about 25 per cent. streptococcus. I, however, have seen many cases that were straight syphilitic, with secondary infection. The fact has been overlooked that many children apparently well have syphilis. Many have general gland involvement and many get secondary infections. Many of these cases can be helped by drainage, but they should also be given antisyphilitic treatment.

Third Day, April 26, 1917.

T. Wood Clarke, M. D., of Utica, *in the Chair.*

The program of the day consisted in an automobile trip to the State Custodial Asylum at Rome, where the Section was entertained by Dr. Charles Bernstein, Superintendent of the Institution, at luncheon and a tour of inspection of the buildings was made.

DR. CHARLES BERNSTEIN, of Rome, gave a clinic illustrating

VARIOUS PHASES OF FEEBLEMINDEDNESS AND THE STIGMATA OF DEGENERATION, PHYSICAL TYPES, ETC.

The problem of dealing with the feebleminded is somewhat different to-day from what it formerly was in that we formerly thought only in terms of idiocy and imbecility and gave little attention to the border-line cases. We formerly had about 80 per cent. idiots and imbeciles and about 20 per cent. border-line cases; we now have about 80 per cent. border-line cases and about 20 per cent. idiots and imbeciles. This change has come about to a large extent because of the introduction of the Binet-Simon tests of mentality. Formerly the work of institutions was merely to provide custodial care, now under modern methods of diagnosis and the consequently greatly increased number of mentally defectives to be cared for new methods must be sought. With the higher cost of buildings and of maintenance the care of a large number of dependents has become a much more serious problem than formerly. As a result we have endeavored to meet the problem presented by the development of a plan of industrial and vocational training, whereby many of these mentally defective individuals become to a greater or less extent self-supporting. It has been our experience that the majority of these mental defectives cannot be taught through the eye or the ear, but they can be taught through the hands. We have had the same problem to solve that has been met with in large industries, the utilization of waste products. We have sought to find a way of utilizing these by-products of humanity and I am going to show you to-day what we are doing.

I am first going to show you some of the types of mental defectives that we have in this institution, microcephalics, hydrocephalics, paralytics, Mongols, idiots, and imbeciles. The idiots, imbeciles and morons have been classified according to the intelligence tests into low, medium and high grade, in comparison with normal children. According to these tests the intelligence of low-grade idiot corresponds to that of a child from one to two years of age; a medium-grade idiot to two to three years of age, and a high-grade idiot has the intelligence of a child of three to four years of age. The intelligence of a low-grade imbecile corresponds to that of a normal child of four to five years; a medium-grade imbecile to five to six years and a high-grade imbecile to six to seven years. The low-grade moron has an intelligence corresponding to that of a child seven to eight years, a medium moron eight to nine years, and high-grade moron ten to twelve years.

The microcephalics, the first one of whom I will show you, being one of four brothers all showing this condition (there are six normal children in this family) are always small in stature, have the small cranium, poor circulation, abnormally long arms and no intelligence. They may however be trained to perform manual labor.

In contrast to these are the hydrocephalics. These hydrocephalics are always paralyzed; at least I have the first one to see who was not paralyzed. They sometimes use their hands a little more than their lower extremities, this probably because they make a more persistent effort to use their hands. There is usually a spastic condition that indicates cerebral complications.

The Mongols are so named because of their resemblance to the Mongolian race. They are small in stature, have obliquely set eyes, fissured tongue, rough scaly skin, coarse hair, etc. They are imitative, that is, they imitate actions but not language. They usually die at an early age of tuberculosis or of some intercurrent disease. Many theories have been advanced to account for this condition but the true cause of the condition is still unsolved.

Cretins are capable of being educated to a certain extent, but not very much. They are benefited by thyroid treatment in many instances, but the thyroid cannot be administered continously. They never make normal individuals. So far as the intelligence tests go they rank with the Mongol type. I have been interested in seeing how early these cases could be recognized. I know of one instance in which the condition could be recognized at six months. I have wondered if it were possible to recognize a Mongol at birth.

I will show illustrations of the various types of stigmata of degeneration. We have here examples of cleft palate and the highly arched Gothic palate. These defects are usually associated with other stigmata of degeneration. These individuals are sometimes monomaniacs; they rank with the medium-grade imbeciles. We have here crab-toe or webbed foot. This deformity is quite characteristic in a family in the Western part of New York; it seems to be transmitted only to the males, the females not showing the deformity but being able to transmit it. This tribe has been traced to a woman who came over from England in 1807 and to whom 250 offspring can be traced, including among their number many prostitutes, criminals and alcoholics.

We have here another stigmata of degeneration, the Darwinian tubercle, a retroversion to an ancestral type. In connection with this subject of physical degeneracy it is interesting to recall the work of Lombroso and Nordau and work that has been done in this country.

We have here another type, showing the flat back of the head. There is no place for a cerebellum. They possess no coördination and no social adaptability. They do little work and are inclined to be "scrappy" and hot tempered.

We have a few defectives who show supernumerary toes. We do not find webbed fingers as often as we find webbed toes.

We have here one individual, a man thirty-seven years of age who is a "lightning calculator." If you should ask him on what dates of the month the Mondays in July would fall he can answer immediately. He is an example of the freaks seen in vaudeville, in sideshows, etc. Nobody has ever been able to account for it or to find out how this man makes his calculations. When these individuals are forced to concentrate on their mental defect they soon degenerate and become demented.

One of the most marked forms of stigmata is asymmetry. Where it is not due to lying on one side or the other and where there is a marked difference in the bony structure of the two sides of the face, I have yet to see in a marked case, a normal mentality.

After your tour of inspection you can see that we are using mostly manual training. We teach these people to do something that occupies them and that is worth something to the institution. They are taught to sew and to weave through which they gain a knowledge of form and color and learn coördination. Our object is to get the men and boys to work on the farm as fast as we can. We are working 1500 acres and last year the farm brought us in $90,000 and it cost us $46,000 to work it. Some of the men as they progress can be hired out either in groups under a foreman or later sent to live with a farmer where they are boarded and receive $100 per year.

The girls are trained to domestic work and when they become sufficiently proficient are hired out at 50 cents a day. Those that can be trusted are sent to live in families of moderate means where the woman has been accustomed to doing her own work; a normal home is a great factor in the development of these girls. Then we have established several colony homes at different places in the State where the girls board and go out by the day. They can thus be kept under supervision. In this institution we manufacture all the clothing for the inmates, and make and repair all shoes, make mattresses, etc. These things show what can be done with these mental defectives.

Dr. Jessie L. Herrick of Albany read a paper on

MENTALITY AND INTELLIGENCE TESTS.

There are to-day 30,000 individuals who are defective in the State of New York of which only 6000 are under custodial care. The animal kingdom received special attention in pedigree, habitat and classification years before we awoke to the reality of the need of the study of the mind in its various reactions. The State cared for fruits and forests, yet fostered within its midst physical disease and mental ineffectiveness, both of which are controllable, and in the light of scientific knowledge largely preventable. I refer to venereal disease and feeblemindedness. The speaker visited every hospital having an ambulance service in New York City from the Bronx to the Battery and carded 2000 diagnosed cases of epilepsy. Altogether there were found 21000 individuals at large believed to be mentally deficient. Throughout the State 8 to 15 per cent. of the children cared for in institutions are feebleminded. The public schools have their quota also. The educational body should possess means whereby a closer study could be made of each child who applies for admission in order that she may be given a fair chance to grow physically stronger and mentally as efficient as her capacity will allow. Our schools have not hitherto grasped this great opportunity to catch the "different" child before her physical age and mental needs get beyond their reach.

We should know the body first—its perfectness, its growth and its deviations; know the mind through a series of mental analyses to determine how far it has developed or is capable of developing. This appears to be preëminently a field for physicians, because as Dr. Terman states in the individual delinquent "The physician has a knowledge of physiological norms and pathological conditions."

We have been examining the physical and mental and moral make-up of children going back to heredity and environment and find that all children and adults fall into one of three mental groups, the normal, the supernormal or the subnormal. Mental endowment has come down to each one through the germ plasm of her ancestry and, according to Dr. Davenport, forms the reacting substance upon which the stimulus of environment plays, with its resultant known as behavior.

This end product, often called "brains," we analyze by using a number of tests, the standardization of which results in a test norm. Anything that calls forth a reaction can be standardized, a story, game or puzzle. We select a number of persons whom we believe have normal ability and the best place to find them is in the graded school, because the grade schedule is made to fit the normal child. For example, the speaker wishing to standardize some tests using the "Peg Board," such as ordinarily used in kindergardens, called at a certain public school and asked that fifteen children be selected from each grade beginning with the third, physical age equal to grade age, and each one having actually passed into the grade. The examiner sat at a table in a quiet cheerful room, and as a child entered, she was given a peg and the board was placed in front of her. She was told to stick the peg into every hole in the board as fast as she could and was timed. This test was carried out with extreme exactness in each grade. Later the average time for each physical age was reckoned and the results are as follows: 7 years, 88.7 seconds; 8 years, 78.1 seconds; 9 years, 65.4 seconds; 10 years, 62.5 seconds; 11 years, 64.9; 12 years, 62.9; 13 years, 60.1 seconds. Therefore we argue that the normal child of 7 years should be able to peg the board in 88.7 seconds, the 10-year-old child in 62.5 seconds, etc. In the course of working out our tests the fact was brought out that several children were capable of doing the feat two or three grades in advance. The teachers, as a rule do not recognize the supernormal child but speak of her as a "bright child." Our school system should be elastic enough to allow these children to go as far as they can mentally; or better still form supernormal classes. Under a good supervision of medical inspection, there would be no danger to the child, while the value to the community could not be estimated. The peg board test applied to large groups of children showed that they fell into four groups: (*a*) Those who follow a definite plan pegging evenly from start to finish; of these it is said concentration is good, they can hold a plan. (*b*) Another group of children start at a corner, but occasionally skip a hole and go back to correct; these are said to have some mental confusion. (*c*) The child of this group begins at a corner, pegs across, takes the next line below and so on, without a change to the end; of this child it would be said, "motor coördination good, normal. (*d*) Begins at the middle of the board and pegs in any direction, may not know when he is through, may look up or glance about; of these it is said that coördination is poor association poor, fails to plan. The latter may be due to mental defectiveness. A physical examination and environmental conditions are considered in summing up in each case.

Other tests have been devised and standardized, as construction tests and story tests; the latter method tested the auditory memory, or the ability to hold, visualize and to correlate ideas. The speaker tells a story and has the individual to be tested repeat it. The story used contains fifteen details and it has been found that a child of ten years could give seven, one of eleven eight, and one of twelve nine details. Two hundred women examined whose ages ranged from eighteen to thirty years could give only one to three details in the majority of cases; thirty-three normal individuals who followed could reproduce the story. The defective women examined seemed much older than their physical age, heavy, sodden, with a forlorn, dragged-out appearance, physical buoyancy gone. This might be accounted for by the fact that all but eleven admitted immorality, beginning in early adolescence. Most of them had also experienced great poverty and had attended school for only short periods. By the use of certain tests the speaker also sought to discover not only the mental age but their ability to image, associate, memorize and reason, all of which are necessary to getting on in the world. Of this series of women only 17 per cent. had normal mentality; 48.4 per cent. were subnormal, and 34.5 per cent. were distinctly feebleminded. Unfortunately these young women, after two or three years at the most, would again be part of our future citizenry, spreading their physical infections and mental defectiveness to succeeding generations. These women were once children and might have been apprehended in the school-room, if the measures we are now instituting to determine physical condition and mental content had been a part of the school curriculum. Each child should be individualized and a special study made of his physical scientific and mental equipment in order to know his various lines of retardation.

DISCUSSION.

Dr. McMurchy, Special School Inspector, Ontario, Canada.—In England last December a conference was held for the purpose of considering educational reforms. One of the observations made in the report issued by this body was that the classes in the elementary schools are too large; the pupils should not number more than fifteen per class.

I have been particularly interested in Dr. Herrick's reference to the supernormal child. We have been so obsessed with the idea of the normal child that we have neglected the supernormal. Under present conditions we see these children mislaid, overlaid or strangled under our school system. This is a sad thing for a democracy, for a democracy is always in need of leaders. Every child above the average should have the opportunity to progress as rapidly as he is able to do.

Miss Jessie Taft of the New York Mental Hygiene Committee read a paper on

HOW CAN WE SAFEGUARD THE CHILD AGAINST MENTAL DISEASE.

The physician may so easily become wrapped up in the study of diseased individuals as to overlook the bearing which his knowledge of disease may have upon the lives of those who are ordinarily healthy. Mental hygiene standing as it does to-day halfway between the medical and the lay world should be translated into a form that will mean something not only to the layman but will also carry over to the medical world the sense of the appalling ignorance on the part of the ordinary man of even the simplest laws of mental life and the crying need for enlightenment and guidance by those who have that knowledge. Physicians have long assumed social responsibility for the field of physical hygiene, so thoroughly and successfully that for all practical purposes there is complete contact on that level between the medical and the lay world. On the level of mental life, however, the laws of mental hygiene, there is at the present moment, almost complete separation between the medical and the lay world. The mental hygiene movement exists solely for the purpose of enlarging this field of contact and thus far its activities have consisted on the one hand in trying through the aid of the mental clinic to get at those milder cases of mental disorder which seldom reach the hospital, as well as those individuals who are just beginning to show symptoms of mental breakdown, and, on the other hand, in educating the general public through mental hygiene organizations and publicity of every kind. With this method of attack our ideal of a fairly complete contact between the lay and medical worlds in the field of mental science is discouragingly distant is not altogether impossible. To make mental hygiene a vital factor in social life we shall have to get another approach. The public school offers not only the possibility of an immensely enlarged contact between the two worlds, but it offers a growing and developing contact which may look forward to an approximately complete union of science and life in the mental as well as the physical realm. This is not such a Utopian idea as one might think at first. It was at one time considered revolutionary to expect schools to look after eyes, ear, noses and throats as well as reading, writing and arithmetic. We have now reached the point where we may ask "Of what use is an education which provides a healthy body and plenty of information but takes no account of the delicate instrument which has to use that body and that knowledge?"

If the physicians as a class could only realize the infinite need of education for the insight into mental life and the method of its growth which the mental specialist now possesses, they would put the full weight of their influence back of a movement to make mental hygiene as much a part of school life as physical hygiene. Persistent unexplained tardiness or truancy, unusual obstinancy, extreme unsociability or shyness, unaccountable failure in class work on the part of a bright child, are recognized, it is true, but they are recognized for the most part as bare facts affecting discipline attendance or scholarship of the class, not as symptoms of a condition in the child's inner life which demands attention. That it is possible for a child to commit suicide because it fails to promotion, as occurred a year ago in New York City, may be an indication of the neurotic character of the child but it is equally an indication of the utter failure of the school to understand the kind of child it is dealing with or to attempt to give that child a more reasonable estimate of the relative value of promotions. Conduct as disturbing as marked stubbornness, truancy, violent outbursts of temper, inability to give attention in the schoolroom, etc., is sure to come to the attention of the teacher even when it is not recognized as a symptom of an unhealthy mental condition, but other more subtle and unobtrusive manifestations usually escape observation entirely. Children who suffer from intense self-consciousness who are fearful and apprehensive, who are markedly unsocial, who show tendency to depression, who are dreamy and unpractical, or who are apathetic and passive, are not recognized as problems because they give little or no trouble. They are frequently excellent in school work and are models of good behavior. They are, nevertheless, quite as badly adjusted as the more spectacular group and in need of training which will get at the root of their difficulties and help them to overcome their unhealthy tendencies. Psychiatry tells us that the only way to materially reduce mental disease of the functional type is to get at maladjusted individuals early, before the results of their failures have overwhelmed them completely. Only the school can do this in any thorough-going way. It can be shown that the normal child is just as much in need of mental hygiene as the neurotic child, in order that he may make the most efficient and happiest adjustment of which he is capable to the social organization in which he must live. The chance method we now permit is too costly and means too much waste. The chief problems of the child are not intellectual but instinctive and emotional. The deepest conflicts of life are not primarily of intellect with physical environment but of impulse and desire with a complex civilization which imposes all kinds of restrictions upon individual expression. If this be true no school is educating a child so long as it deals only with the intellectual and physical life and ignores the great body of instinctive and emotional needs which are growing up along with the intellectual. Mental hygiene in the schools would not mean that a teacher be able to recognize the premonitory symptoms of dementia precox or manic depressive insanity or even psychoneuroses, but it would involve a different attitude on the part of the teacher and an understanding of the significance of persistent failure on the part of a child in any direction. Teachers should know more about psychology. Much has been done for the feeble minded in special classes. This special class attitude should be applied to the neurotic child. When that is accomplished it will not be long before that mythical normal child, who has made us so slow and stupid in arriving at mental hygiene will fade away, and all classes will become special classes, and all teachers special teachers. Before that happy day, medical schools will have to produce more psychiatrists and give us mental clinics to which the teacher will refer the neurotic child who is even now a problem. All who are dealing with this class of child would welcome the psychiatrist and the mental clinic which would solve this problem, show where the difficulty lay and what could be done to adjust it. If you physicians will give us the psychiatrists and the clinics, if you will put your influence back of mental hygiene in the medical schools as well as the public schools you will find the schools not only ready but crying out for the kind of help that only you can give.

Dr. W. W. Millias of Rome gave a Clinic on

TYPES OF JUVENILE PSYCHOSES.

The most conspicuous difference between feeblemindedness and insanity is that the feebleminded individual is capable of being taught a routine and will follow it from day to day. The insane feebleminded are changeable from day to day and cannot be induced to follow any routine. The types of psychosis here presented are of the latter variety. These boys will not follow a routine, are from one thing to another, commit all kinds of lawless acts.

One characteristic of insanity in children is that children do not have hallucinations or delusions, but they are always very motile. These boys lie, steal, swear, and are generally incorrigible.

Dr. W. B. Cornell of New York.—I would hesitate to express an opinion in regard to these cases but I should be inclined to consider them as belonging to that type known as defective delinquents, a class that is giving a great deal of difficulty at the present time.

Dr. William Burgess Cornell read a paper entitled

PSYCHOLOGY VERSUS PSYCHIATRY IN DIAGNOSING FEEBLEMINDEDNESS.

Your program framer has arranged this title; it is not just what I intended. It looks belligerent and indicative of some sort of a contest between psychology and psychiatry. The title, however, is not inapt inasmuch as there has been for some time conflict between these two groups of workers. The Binet-Simon test for measuring intelligence has been used by a great many examiners with more or less psychological training most of whom were laymen, who have gone into schools workhouses, jails, prisons, institutions for the mentally defective and even into hospitals for the insane, applying the scale and on almost no other basis have made diagnoses of feeblemindedness. It is not my intention to minimize the value of the results of all this inquiry. There has resulted a remarkable public interest in the mental defective and one hears, as a consequence, on all sides loud clamor for the solution of the so-called problem of the feebleminded. But there have developed some very erroneous conclusions, bad diagnoses, and bad statistics. The original use of the Binet scale was to provide a ready method of classifying the intelligence of the Paris school children. There was no intention expressed that it should be used on adults. Briefly, we have in the way in which this scale has been used, a lay person examining diseased or abnormal states of mind, and making diagnoses thereon. This is quite a departure from the legitimate field of psychology, so much so that these testers themselves appreciate the fact and have called themselves clinical psychologists. Some have gone so far as to object to physicians using the scale, on the ground that the scantum of the clinical psychologists has been invaded. In some cities, particularly New York, these Clinical, psychologists have private practices, are carrying on treatments and it almost seems that we shall soon have a new cult, if indeed such is not already established. Some one should call a halt to the tendencies of the clinical psychologist to invade the work of the physician, or more properly the psychiatrist. Medical men have no one to blame for present conditions except themselves. The medical profession has been slow to take up this new branch of psychiatry, and consequently the clinical psychologist has found himself alone in the field.

As a rule, the clinical psychologist is not concerned with the causes of feeblemindedness. The scale is applied, the child is feebleminded—and should be segregated—nothing easier. In this whole matter there is much need of common sense. The medical profession is now waking up and beginning to realize that feeblemindedness is not the simple affair our psychologists would have us believe, to be measured with the Binet scale like a yard stick, nor is its immutable transmission as a unit characteristic quite as likely as Goddard would have us believe.

We are beginning to know that feeblemindedness can arise from a large number of causes, and that the study and determination of these belongs to medicine, or rather psychiatry.

Our medical development in regard to the feebleminded is about where the mental hospitals were twenty-five years ago. There is great need for organization of the institutions for the defective along the lines of the best psychiatric hospitals. The combined efforts of the clinicist and the pathologist will at no distant date throw light in dark corners and the group of so-called primary aments, now a very large one, will become progressively smaller as real etiologies become known. In the organization of the new hospital I would not have you believe that there is no place for the psychologist. The legitimate function of the latter is the development of psychological methods, applied psychology, in the study and in the testing of mental processes. But there is no reason why the trained psychiatrist cannot correctly give any of the present-day intelligence scales as part of his routine work. The real psychologists find an ample field in devising new methods, correlating psychological findings and educational work, checking up the testing work, and training the testers in the institution, besides opportunities for pure psychological investigation and research, and does not get completely out of his sphere by making physical examinations, passing on tonsils, eye-grounds, etc., making diagnoses and even suggesting treatment. The psychologist should not make diagnoses at all. Observations and results should be interpreted by the psychiatrist. In illustration the case of a boy of ten years may be cited. This boy had been diagnosed by a clinical psychologist as a "hopeless mental defective," in spite of the fact that their own rating gave the boy a mental age of 7.6. Our examination showed the little patient very much undersized and that his whole condition was probably due to some endocrinal cause. Far from labelling this boy hopelessly feebleminded we even ventured a relatively good prognosis, particularly since he was less than three years retarded.

The diagnosing of feeblemindedness is becoming more and more a serious and difficult matter—it is not so easy as one thought it was. With legal commitments and registration coming more and more into use, we pause and consider before placing a life-long label of such consequence to all parties concerned.

A case of defective mentality, or a "primary ament" that we formerly felt too sure about must be considered from all angles of family and personal history, and then beside the actual mental testing and psychiatric examination there should be a thorough clinico-pathological inquiry, including Wassermann, spinal fluid, and other procedures, all with the purpose of discovering a cause for the mental defect. We are fast getting beyond the stage where we have been content with the simple diagnosis of feeblemindedness, but we will make better progress when more physicians interest themselves in the subject than we find at present. Certainly the work must be done by the psychiatrist, and the psychologist is only qualified to inquire into certain phases thereof.

DISCUSSION.

MR. JAMES P. HEATON, Secretary of the New York Committee on the Feebleminded (by invitation).—Being neither a psychologist nor a psychiatrist but being so situated that I hear from both sides, I am not prejudiced one way or the other. Before assuming my present office I was warned that the physicians of the State were not interested in this problem of the feebleminded because it was not like typhoid fever or pneumonia, and did not lend itself to treatment. I have been surprised to find that this was not true during the last two years at least. Our Committee feels that it has the real support of the medical profession and we want not only the support of the medical profession but of everybody. People do not like to have their children called feebleminded and are much more likely to accept such a diagnosis if made by both the psychologist and the psychiatrist. Again we must remember that the Binet-Simon test is not adequate if used exclusively. Had I been tested by this scale when a child I would most certainly have been pronounced mentally defective.

The purpose of our Committee is to educate the public and to arouse a wide public interest in this subject. The problem is one that hits society in so many ways that we need the coöperation of everyone and particularly of the doctors in solving it.

Dr. Ethan A. Nevin of Newark, N. Y.—The physician deserves to be scored by the psychologist. He seems to think the distribution of remedies and the writing of prescriptions is the limit of his sphere. We should have a better course in our medical schools in psychology and psychiatry. We must handle this problem from the standpoint of the child and not wait until the child reaches adolescence before giving attention to his mental condition. When a child begins to fail to make his grades in schools we should endeavor to see what is wrong. This controversy between psychologists and psychiatrists is petty. The physician should know more about psychiatry. If he recognizes that something is wrong with the child and takes it up in the right way a great deal might be done. He need not necessarily send the child to the psychiatrist but he can do much in an indirect way as he sees these children early in life. He might by remedying physical defects and regulating the lives of certain children save many more than otherwise can be saved from permanent mental deficiency.

Dr. F. W. Barrows of Buffalo.—At the present time there is a stigma attached to a child that is said to be feebleminded and has to be sent to an institution. This is all wrong. The people should be educated to know that the facilities offered by institutions can do more for the defective child than can be done in the home, and the children of this kind are happier in an institution than in a home where they are not understood and are maladjusted.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of May 10, 1917.

Roger H. Dennett, M. D., *in the Chair.*

Dr. Henry Loundes Lynah read a paper entitled

THE AURAL COMPLICATIONS OF THE EXANTHEMATA.

The percentage of acute suppurative otitis media in the exanthemata is governed by the degree of severity and the duration of the nasopharyngeal lesion at the outset of the disease.

In diphtheria, even when the throat lesion is severe or of the nasopharyngeal or glandular type, it is rather rare to meet with aural complications. The percentage of aural infections in this disease clinically varies from 2 to 4 per cent., the greatest proportion of infection occurring in the intubated cases. A few years ago it was the custom at Willard Parker Hospital to feed all intubated cases by the gavage method; the percentage of otitic complications at that time was extremely high, between 6 and 10 per cent., about four times as great as at the present time. The same routine was practised at the Kingston Avenue Hospital, but since these methods have been discontinued, aural complications are almost unheard of. I have yet to see an adult with diphtheria develop a mastoid. I have, however, had the good fortune to observe one case in which there was an extension of the diphtheria membrane through the eustachian tube into the middle ear, an occurrence which I believe is exceedingly rare. The extension was bilateral. Both drum membranes were incised under gas, a long incision being made which was followed by free bleeding. The ears were irrigated with a warm boric acid solution and antitoxin administered. In the course of twenty-four hours both incisions were closed with the exception of a small pin-point opening and were covered with diphtheritic membrane. A small portion of the membrane extended outward and involved the floor of the right canal. With a pair of bayonette forceps the diphtheritic membrane was removed from both drum membranes. Applications of antitoxin were made to the drum membranes alternated with hot irrigations. At the end of five days the condition had abated and the middle ear gradually returned to normal. The patient's hearing at the present time is practically normal.

In scarlet fever the percentage of aural infection is seldom below 10 per cent., and may even be as high as 30 per cent., there being a marked variation according to the severity of the epidemic according to figures collected by different authors. The great majority of aural complications in scarlet fever occur early, during the first to third week of the disease, but may develop as late as the tenth week. The writer feels that the local nasopharyngeal lesion is wholly responsible for all of the otitic complications and disregards the fanciful idea of the otitic lesion being a manifestation of general infection independent of the pharyngeal lesion. The tonsils and adenoids are a constant source of infection and reinfection during convalescence which I think accounts for aural complications late in the disease.

The early aural infections usually occur in the postnasal and glandular type of scarlet fever in contrast to the small number of infections which occur in the similar type of diphtheria. These early complications are often masked by the dull mental condition of the patient, and if the drum membranes are not examined from day to day, mastoid complications may be well advanced before they are recognized. When the membrane is at all reddened it is well to make a free incision before spontaneous rupture takes place. The temperature in this type of case is high from the outset of the disease, and the aural complications seem to have no more influence on the temperature curve than the cervical glands or accessory sinuses of the nose which are involved in each instance.

In measles the percentage of aural infections also varies with the severity of the infection and is usually from 10 to 12 per cent., but may be as high as 20 per cent. clinically. The greatest proportion of infections occur in the catarrhal and postcatarrhal stages and seldom later than the end of the second week. At times aural complications in mealses may be extremely violent as in one case coming under my observation, in which a middle ear and mastoid developed on the fifth day, and acute purulent labyrinthitis on the eighth day, and the patient succumbed two days later from a diffuse purulent leptomeningitis. This was the most fulminating type of aural complication that the writer has ever seen.

In a study of the cardinal symptoms of aural complication in the exanthemata taken collectively, it is not so much to the symptoms that are present, as to the absence of symptoms that I would direct attention. The age of the patient has an important bearing on the aural complications. In diphtheria, intubated cases in young children are the most susceptible to aural complications on account of constantly coughing secretion into the nasopharynx; adults are seldom ever attacked. In young children the susceptibility to aural complications in scarlet fever is usually greater than in adults. In measles, the child and the adult are equally susceptible, and the adult far more frequently complicated with mastoiditis.

Pain was frequently masked at the outset and as a constant sign was rather unreliable; impairment of hearing might make its appearance early and always called for prompt aural examination. The temperature is invariably high at the outset in all severe types of scarlet fever and measles, and the otitic complications seem to have no more influence on the temperature curve than the necrotic throat lesion or cervical glands. In many instances subperiosteal abscesses may develop with no rise in temperature, and it is not infrequent in in scarlet fever and measles to find extensive destruction of the mastoid process and the temperature not be elevated above 99°. The temperature curve while usually an important symptom is frequently subject to wide variations.

The appearance of the drum membrane in the ordinary catarrhal type is little different from that of the ordinary infections. Marked retraction is far more frequent than bulging in the severe cases early in the disease, but when middle-ear infection takes place the membrana tympani present a peculiar purplish gray color and are not of firey redness. Sagging of the posterior-superior wall of the canal is a fairly constant sign and it is not infrequent to see the whole of the posterior wall so markedly infiltrated that the membrane simulates furunculosis and the drum membrane is seen with considerable difficulty. On the other hand there are instances in which there is but slight injection of Shrapnell's membrane extending down along the hammer handle; these present a typical picture of tubotympanitic congestion, with no marked pain referable to the middle ear or mastoid, no temperature or marked impairment of the hearing, but constant irritability, a peculiar feeling in the head, and inability to sleep. The writer has incised membranes on this one symptom and in almost every instance there was a profuse discharge from the middle ear a few hours later. Tenderness over the mastoid process or antrum is in many instances an unreliable symptom when this symptom is present it may frequently be masked by the application of an ice-bag or Liter coil and hence in the writer's opinion their use is contraindicated as they may lead to a great source of error. The character and duration of the discharge and the appearance of the drum membrane as to sloughing, and persistent sagging of the canal wall are the most reliable signs indicative of mastoid involvement.

It is rather surprising in these diseases to note the absence of such complications as brain abscess, sinus thrombosis, etc., in comparison with the ordinary types of aural complications. I can recall but one case of sinus thrombosis of ototic origin operated upon at the Kingston Avenue Hospital during the past five years. This case was complicated with metastatic joints, focal necroses of the liver and septic infarct of the spleen, and terminated fatally. Internal jugular vein and sigmoid sinus thrombosis were noted in four cases without any involvement of the middle ear or mastoid, antrum during life, or at autopsy. I have never seen a brain abscess as the result of an aural complication and labyrinth in involvement is also rare. Of meningitis two cases have been recorded.

Preventive measures are, of course, the removal of tonsils and adenoids. The antistreptococcus serum has apparently done good when used locally and is worthy of further trial. Nose and throat irrigations have been blamed for the high percentage of aural complications; they may be a cause but when carefully performed seem to have little influence of the otitic complications.

The treatment of these conditions are purely by surgical methods. Early and free incision of the drum membrane is indicated when there is the slightest sign of congestion always preferable to spontaneous rupture. I am not a believer in the ultraconservative method, and certainly when the aural complication in the cardinal one, it demands prompt attention. In many complicated cases operative results are not gratifying and the hearing apparatus is saved no better than the life of the patient. On the other hand when the middle ear and mastoid symptoms occur late, the hearing is always saved in spite of other complications. The writer's observations have convinced him that early operation in mastoid disease is absolutely contraindicated in the case of many complications. He has been practising conservative measures in all of his many complicated cases and has had a very low mortality.

In all cases of exanthemata the aural condition should be carefully followed from day to day or else aural complications may be far advanced before the condition is recognized.

Dr. Henry Koplik said: I was very much interested in the part of the paper that I heard. I would like to ask the reader of the paper if he has made use of an examination of the ocular fundi in cases in which both ears were involved and it was difficult to determine on which side there was sinus involvement. This examination was sometimes very useful as one may find hyperemia and choked disc on the side that is involved.

Also, I suppose there will always be a strife between the otologist and the pediatrician with reference to operating on severe cases of otitis in babies, six months of age, or one year or up to two and one-half years. In these severe cases of otitis whether they are primary or secondary to some one of the exanthemata there must be some involvement of the mastoid; the mastoid is as a rule infected. The only question is whether they shall be drained from in front or behind; whether they should be cut and drained early or should be drained from the canal. When there is swelling and sagging of the posterior wall of the canal I do not deny that there is usually mastoid involvement, but these children get well by free repeated incision of the posterior wall and incision down to the bottom of the canal. The average otologist is satisfied with a small incision. In my hospital service free incisions are made and we have very satisfactory results in many cases, and it is very seldom that we have to do a mastoid operation. If the otologist is willing to repeatedly open up very freely he will find that these patients will get well right along without doing a mastoid operation.

Dr. Henry Heiman said: We all have enjoyed this paper very much because of the many facts brought out, but I, also, wish to register my protest against the too frequent and promiscuous incision of red ears. I used to permit the incision of these ears by the consultant whenever he advised this procedure and had three or four mastoids a year. Now when I do not allow the consultant to dictate in so many of my cases I have not had more than one mastoid in ten or twelve years. There must have been something radically wrong in doing a free and early incision; we have found that if we wait and manage the case on common sense lines the children get well in most instances, excepting where there is intense pain and bulging. I have been ultraconservative and I have had no reason to regret it. We may often have simply an ordinary catarrhal otitis and these patients will get well without operative interference if we have a little patience.

Dr. Lynah, in closing the discussion, said: In answer to Dr. Koplik's question as to whether the ocular fundi were examined, I may say that the fundi were examined in the case with the positive blood culture but no papillitis was noted by Dr. Wootton the ophthalmologist in either disk. It has been our experience that papillitis is a sign of sinus thrombosis but no choked disk was present in the case recorded even though we had a positive blood culture and knew that there was some venus sinus involvement. I mentioned that as we were unable to tell which sinus was involved as the patient was admitted with all of the accessory sinuses of the nose involved as well as the mastoids we played the waiting game and the patient recovered.

Of course some of the cases recover after free incision of the drum membrane and mastoid operation is not necessary, but in others frequent incisions are necessary and even then proper drainage was not established. It seems to make little difference as to the size of the incision or whether we make a posterior triangular cut all of them have a tendency to close and leave only a small pin point opening causing damming back of drainage and finally we have to do a mastoid operation. I do not however believe in doing a mastoid operation on every case that shows only one or two symptoms, for many do get well as a result of the primary myringotomy, but I am speaking of the cases which require many incisions to establish drainage. In these cases drainage is never established until mastoidectomy is performed and certainly frequent incisions always calls for mastoidectomy.

About the early incisions in the slightly reddened drum membranes which Dr. Heinman has referred, it has been my experience that the slightest redness of the drum membrane in the exanthemata called for immediate and free incision rather than allow spontaneous rupture. For it was not at all uncommon to see after spontaneous rupture complete destruction of the drum membrane leaving the inner tympanic wall plainly visible. He then referred to a case seen in private practice the cause of the infection being the Friedländer bacillus. The patient was a very prominent physician of this city who was suffering with what was supposed to be tubotympanic congestion from the clinical picture. There was no congestion or bulging of the drum membrane, and the membrane was apparently perfectly normal with the exception of a very slight reddening about the hammer handle and umbo. There was no temperature but there was a distressing feeling about his head and constant inability to sleep. He was seen by several of the aurists of this city who agreed that there was no indication for myringotomy and one of them informed him that he had "mastoid on the brain." Finally after one week of suffering with the annoying symptoms of irritability and inability to sleep the drum membrane was incised. There was free bleeding at the time of incision and the drum membrane cut with a leathery feel and not with the parchment-like feeling of a normal drum. No pus followed the incision but three hours later there was a profuse discharge which showed a pure culture of the Friedländer bacillus. The mastoid cavity was opened the following day and the dura was found to be almost completely uncovered over the cerebrum there being a large epidural abscess. Had not the incision been made in the drum membrane on the two symptoms of constant irritability and inability to sleep the patient would have undoubtedly developed meningitis. The incision was fortunately made in time and the operation saved his life.

Dr. Henry Dwight Chapin read a paper entitled

SYSTEMATIC BOARDING OUT VS. INSTITUTION CARE FOR INFANTS AND YOUNG CHILDREN.

The charts presented were prepared by the State Board of Charities and show the relative average rate of increase in the population of the State as compared with the fluctuations in the population of the institutions for children. These tables show a much smaller number of children at the end of each year than were admitted during the year. While some of these infants were discharged or transferred elsewhere a very large number died. As the number of infants in the institutions at one time is not given the mortality rate cannot be given, but a study of this question by the committee of the American Association for Study and Prevention of Infant Mortality, based on the statistics of eleven institutions operating in New York State, shows that for the five years from 1909 to 1913, inclusive, 28,210 children under two years of age were cared for by these institutions and that the death rate for babies under two years during this period, based on the total number of children cared for, varied from 183 to 576 per thousand with an average mortality rate for the eleven institutions of 422.5 for the five years. During this period the death rate for children under two years of age based on the estimated population of the State at that age was 87.4, practically one-fifth that of institutions.

The institution is not a favorable place for the permanent housing of infants, because the infant needs individual watching and care. It needs a home and a mother. The farther we get away from these normal conditions the more the baby suffers. A baby can lose from a restless untended night the good that may have taken days of care to secure. Babies in institutions rarely get sufficient fresh air and oxygen is as necessary to their well-being as protein or fat. There are other dangers in collecting and treating infants *en masse*, such as pertussis, diphtheria, and the exanthemata. Institutional infants seem to loose their immunizing power against bacteria after a time. In view of the failure of the institution to solve the problem of the care of the dependent infant, the Speedwell Society organized some fifteen years ago to oversee and carry out the work of boarding out infants in homes. The plan followed requires that the work be done in certain definite localities, that serve as units. Each unit must be under the charge of a physician and a nurse and such assistants as they may need. The same care, system and routine applied in institutions must also be applied here. The advantage of the plan lies chiefly in the fact that the work is done largely through human agencies instead of depending over much on a plant or machine. The Speedwell Society emphasizes the following points: First, a district was chosen which was noted for its healthful conditions. Second, there has been constant attention to diet and hygiene on the part of the physician and nurse in charge who are thoroughly competent to deal with this class of cases. Third, the infants are kept as long as necessary. Work is kept up during the whole year. Fourth, the training in a given neighborhood of a number of foster mothers, who by constantly taking these infants into their homes, become fairly expert in handling babies under conditions totally unlike those offered by the best institutions, and far superior to them. Each village around a city could have its unit with doctor and nurse working under the direction of a local committee.

From the financial standpoint this plan is thoroughly sound. Instead of investing large sums of money in institutions and heavy overhead expenses, the funds would be given directly to individuals for their services. The money thus expended serves a two-fold purpose; it provides the infant with the home which it needs, and it assists a family in poor circumstances and raises its standard of living. Buildings used as institutions of this kind are not taxed, which means that the community at large must make up this deficit by additional taxation, and this indirectly contributes an additional cost. The Speedwell method of carefully regulated boarding out, including the salaries of the doctors, nurse, and all, incidentals and necessities amounts to $1.15 per day as against a cost ranging from $1.54 to $1.98 in four hospitals in New York City.

In the Speedwell unit at Morristown, N. Y., we have had a mortality during the past year of 16 per cent. among a class of marasmatic babies under six months of age everyone of which would ordinarily have died under institutional care.

Honorable John A. Kingsbury, Commissioner of Charities, spoke on

THE CARE OF THE CITY'S DEPENDENT CHILDREN.

As Dr. Chapin was speaking I realized more than ever the advantages of the system for caring for dependent children which he has put into effect, and how little I have accomplished in the last three years in my endeavor to shift from the mass plan to the individual plan. We inaugurated on March 1 of this year a policy which will result in a more marked diminution of the infant death rate than has been seen in many years, if, indeed, ever before. In 1916, 16,000 infants died in New York City and of these 1000 deaths occurred in the population of one institution alone. In saying this I am not arraigning any particular institution but simply showing the high infant mortality in institutions. I am not here to shift the burden on other shoulders. It is my burden, and some of it is is on your shoulders. You have not fulfilled your citizenship until until you have come forward and put it up to the Department of Charities to do their duty. You have this power, for no one holds office but by your consent. I hold the State Board of Charities most culpable in that they have not seen that the overseers of the poor do their duty.

Now as to the work which we initiated March 1. We ordinarily commit about eighty-seven babies a month without question. The mothers simply giving the babies up, by surrender. The State Board of Charities requires that the Commissioner of Charities shall see that the dependent child gets a chance to develop into a strong, normal man or woman, but the law also requires that we investigate the circumstances of every proposed commitment and find out whether the child should be a public charge, whether its parents have settled in this city and whether they are able to support it. Some controversy grew out of the question whether these children were properly committed, and we made an investigation into commitments. No one seemed to know much about how these commitments were being made and we decided to throw light into the realms of darkness. Most of the institutions were willing to be investigated but a few thought we had no right to interfere, that it was none of our business whether "Johnny Jones" had warm clothes and went to school; the reason we had trouble was because we started out to make it the business of the Deprtment of Charities to know whether Johnny Jones was properly cared for. The investigations made showed that in some of the institutions the children had vermin and were overworked and underfed. I am delighted to be able to report now that the results of a recent inspection show that the children are no longer overworked and underfed, that they are no longer sitting on backless benches and eating from coverless tables and walking lock-step. We have made some headway.

Since last October the children under eight years of age that have applied for commitment have been given to foster homes and not to institutions. About 4000 children have been placed in temporary homes in this way. The number of children in institutions has been about 24,000; it is now 20,000. If our present program can be continued, within four or five years we will have reduced the institutional population to 10,000. It is what you as physicians are going to do toward this work that is going to count. Practically all normal children are going to be put into normal homes.

We are also planning an investigation of the children at present in institutions for the purpose of classifying them. All those children whose parents have died of tuberculosis will be given the von Pirquet test and these children will be put in open air schools; this will mean about 50 per cent. of those in institutions. Many of these will be better cared for in institutions than in homes. Then we will take the cripples and put them together and the blind and the deaf each by themselves. We are going to do this even if it costs considerably more than is being expended at the present time.

We have another curious anomaly. There are 15,000 normal children in institutions that need normal homes and there are about 15,000 mentally defective children that are a burden and a constant source of trouble to their parents who should be in institutions and should be segregated. In order to provide for some of this latter class we have been rebuilding Randall's Island. I feel that I have concentrated my attention too much on the work at Randall's and Blackwell's Islands and have neglected this work of Dr. Chapin's and that I am responsible for a high infant death rate, but I have been much harassed in the administrative work.

In our investigations we have found that many children of nonresidents have been committed and also that though the law provided that children shall be placed in institutions of the same religious faith as that of their parents, that this has not been carried out as faithfully as it should have been. We are now seeing that this part of the law is carried out.

Of the women who come to surrender their children many are married and another child is a burden too heavy for the family.

Then again we have the unmarried mothers who wish to surrender their children. In many of the latter cases we have succeeded in finding the father and making him assume a part of the burden of supporting the child. We have found that if we can convince these unmarried women of their responsibility toward these children they decide to care for them. A great feature of our work is paying mothers to care for their own children. The married mothers are always glad of this opportunity and when these unmarried girls can be persuaded to keep their babies it not only saves the baby but the mother as well.

I wish it were not so difficult to take a new step, but it is the most difficult thing in the world to make a change as we are so hedged about with "red tape" and formalities. If it were not so difficult to take this step I think we could have several more units like those described by Dr. Chapin but "I mean to continue to fight it out on this line if it takes all summer." The nearer the baby can be kept to the mother's breast the better chance it has for life, health, and strength; if we do not leave the baby with its mother its chance is gone. The death rate of New York is going down this summer, for which I suppose the milk stations, the Health Department and other agencies will take the credit, but it will be because we are putting children in homes where they can receive a mother's care.

THE CARE OF SICK CHILDREN IN THE HOME.

MISS LILIAN D. WALD.—I am glad to have the opportunity to urge the doctors to utilize to a greater extent the service I am going to describe here to-night. I refer to the Visiting Nurses Service of the Henry Street Settlement. In 1916 our service cared for 29,015 cases, 33 per cent. of which were referred to us by physicians. A very small percentage came from various agencies. Next to the largest percentage of our cases came from the Metropolitan Life Insurance Company. Some have come from the social service departments of hospitals, which notify us when a patient has been discharged from a hospital and needs further daily care.

Dr. Chapin and Commissioner Kingbury have referred to the possibility of education in the homes. It is our experience that we almost never find these mothers unteachable, if we know how to approach them, use their own terms in making explanations and use their own utensils with which they are familiar. We have had three years' experience in a milk station provided from Mr. Macy's private dairy. Among the babies cared for by this station the death rate has been one-half of 1 per cent. We have been able to get into the factories at noon to address the workers and we have been coöperating with the Committee for the After-care of Infantile Paralysis.

In the beginning we had some difficulty in making the doctors understand the advantage of sending for us unless we stayed all day. We are conducting an economical visiting hospital. Nearly 30,000 people have found it to their advantage to have a nurse accessible, and these not only the very poor but people on small salaries. Our hospital extends from the Battery to Yonkers and we are hoping to extend its services to Richmond and Queens.

It is not possible to make accurate comparisons between our results and those obtained in hospitals, but we have been able to get extremely valuable information with reference to the results in pneumonia. Some deduce from the very favorable results that we have obtained that the children we have cared for were not so ill, but I assure you some of them were extremely ill. The records show that we cared for 3988 cases of pneumonia last year with a mortality of 8.6 per cent. Of the 3988 cases 70 per cent. were children under five years of age. We have had more pneumonias than any other single disease.

Each nurse has a small district and starts out in the morning to make the calls in that district that have come in. The doctors who have learned to avail themselves of this service leave instructions as to the nursing treatment that is to be carried out. Our care of tuberculosis patients is limited to bed patients and here we have been able to do a useful work by inducing many who did not feel disposed to go to institutions to decide to take this step. Where the care is needed we put on special night nurses. The poor are cared for free of charge and those able to pay a little pay 5 or 10 cents a visit; that 5 or 10 cents a visit has amounted to $10,000 during the last year. The nurse makes one, two, or three visits a day as the case may require. Of the nearly 30,000 patients treated during last year over 26,000 were cured. Both physicians and the public are invited to inspect this service and to take advantage of it.

A PROPER BASIS FOR A LAW TO PREVENT OVERCROWDING IN INSTITUTIONS AND HOSPITALS FOR CHILDREN.

Report of Committee appointed by the Section of Pediatrics in response to a request the Executive Secretary of the Public Health Committee of the New York Academy of Medicine to render an opinion as to what constitutes a proper basis for a law to prevent overcrowding, which is prejudicial to the health of children, and as to the advisability of changing the present law. THOMAS S. SOUTHWORTH reported for this committee, the other members of which were DR. WILLIAM L. STOWELL and DR. PHILLIP VAN INGEN.

An examination of the present law seems to show that it was designed to apply to dormitories or sleeping quarters of older children, and that there is no evidence that the framers of the law had in mind its application to infants, whose nutrition and susceptibility to disease call for the best possible care and hygienic surroundings, differing in no essential respect from those obtaining in hospital wards. That hospitals are specifically exempted by the law strongly supports this view. It has, however, for many years been applied to such infant wards in institutions.

While specifying 600 cubic feet as a minimum, the law gives any local board of health the power, in any ward where the opportunities for ventilation are judged sufficient, to reduce this allowance for each occupant of the ward to any degree which they approve. Under this clause the space required per inmate has been reduced in many institutions caring for infants to about 500 cubic feet and printed and written permits are issued therefore which must be displayed in the wards.

The Monthly Bulletin of the New York Board of Health, August, 1916, states that anything below 500 cubic feet per person is insufficient for an office worker who is obliged to remain indoors practically throughout the year. These adult workers have opportunities to get much more fresh air during their non-working hours. Institution infants throughout a considerable part of the year remain commonly in the same crib and ward practically continuously during the entire twenty-four hours, and their attendants who are not considered or included in the permit, help to vitiate the air of the ward.

Three main factors enter into the question of cubic space per infant in a ward. (*a*) space to afford reasonably pure air for respiration. (*b*) Space to allow sufficient separation of the cribs in order to minimize air-borne infections. (*c*) Space to avoid the overcrowding which operated to reduce the individual care which can be given to each infant by a limited number of nurses and attendants.

Metabolic requirements of the infant are greater than those of the adult, and there is therefore need of a proportionately greater amount of oxygen. The metabolic experiments of Vierordt and others make it clear that the respiratory needs are but a single factor. Equally important are the temperature, humidity, and barometric pressure, and motion of the air in determining the heat expenditure of the body.

Experience has shown that while breast-fed babies may do fairly well under conditions of overcrowding which are fatal to bottle babies, the artificially-fed infant requires a maximum of space in order to thrive.

For respiratory purposes an adult needs 30 cubic feet per minute of fresh air. Modern hospitals for adults require 1800 to 2000 cubic feet, with more for infectious cases. Inquiry shows that pediatrists generally feel that children should have 1000 to 1500 cubic feet available, and these amounts are provided in the most modern hospitals for infants. The present law refers to ventilation free and adequate, as if it were the simplest matter in the world. Mechanical methods of ventilation are admittedly unreliable. The mere presence of windows as noted at an annual inspection does not guarantee their use nor their effectiveness in ventilation. It is absurd to base cubic space for infants, permitted by law, upon standards so low that to prevent their being injurious to the infants they just be supplemented by measures which are often notoriously absent or neglected in common practice, and which up to the present time there has been no adequate method or power for enforcing.

When one considers the stress now laid by pediatricians upon the part played by ward infections in the morbidity and mortality of infants when gathered together in numbers, the present proximity of cribs permitted by the law is to be condemned. It has been shown that overcrowding results in undercare and pediatricians are unanimous that care is imperative if artificially fed infants are to be made to thrive. The pediatrists in the infant's wards in the hospital of the University of Minnesota have specified six feet as the desirable minimum for the separation of cribs. If every infant were allowed a minimum of 100 square feet of floor space, equivalent to 1000 feet of cubic space, or more, according to the height of the ceiling, this distance of six feet could be approximated.

In view of the foregoing the committee further reports that the present sections of the State law should be repealed or superseded and new sections enacted, making separate provisions for institutions in whose dormitories older children above the run-about age spend their sleeping hours. Also separate provision should be made for all wards containing artificially fed infants under fifteen months of age, all such wards being considered as hospital wards, whether the infants therein be nominally admitted or rated as well or sick infants.

The law should provide for the installation in all wards of devices for window ventilation which shall be practicable at all seasons when the windows are closed, and should provide for frequent inspections to observe and enforce their use. Six hundred cubic feet as a general basis for babies, sick or well, nursed or bottle-fed, is too small. Two feet of separation for the beds is too small to reasonably minimize cross infections. Pediatrists are of the opinion that 1000 to 1500 cubic feet are needed. Where the standard is based on cubic space alone the above should be required. A standard of not less than 100 square feet of floor space should also be adopted. Artificially fed babies should be rated as sick babies. New-born infants might be excepted for a period of two weeks after birth if nursed at the breast.

Cubic space is not a complete standard. Ventilation is important and complementary. Exceptional standards might be allowed in well kept, efficiently managed and properly ventilated institutions, but such standards should be definitely outlined by the Department of Health and should take into consideration, height of rooms, floor space allowed, sunlight (exposure), facilities for ventilation, methods employed to secure proper ventilation, character of babies received, number of babies in a given ward, length of time spent in wards proportion of nurses to babies cared for, number of adults in wards at various times, and the infant mortality in the institution in question.

The standards of pure air are apparently as follows: temperature 62 to 68° F.; humidity 50 per cent. (Wet bulb thermometer should register below 70° F.); movements gentle currents, 3 feet per second, 2 miles per hour. Carbon dioxide content ought not to exceed six parts per 10,000. The air should be free from dust, microörganisms, gases and odors; it should not contain above 50 microörganisms per cubic centimeter. Twenty cubic feet per minute should be allowed per child.

DISCUSSION ON DR. CHAPIN'S AND MISS WALD'S PAPERS.

DR. MAURICE FISHBERG said: You may be surprised that inasmuch as I am not a peditrician I have been asked to participate in this discussion; it is because for years I have been interested in social medical work. Medical sociology has always held an interest for me and thus I have come into contact with Miss Wald. Dr. Chapin's work in boarding out infants has interested me for years.

Miss Wald has obtained most remarkable results in caring for sick children in the poorer sections of this city, where the people are living in badly ventilated tenements, many of them vermin ridden. It is noteworthy that given 100 cases of pneumonia in infants and children cared for in the best modern hospitals and at least 33 per cent. will die. When you compare this with the low mortality obtained by the special care given by these nurses in the homes of the children you will feel convinced that such work will not only save New York, but it will save the world. You will also come to realize that proper ventilation is by no means the only factor in the proper case of sick children.

Dr. Chapin has rendered a service to the country; he has been a true pioneer in this work which has not been appreciated to the extent it deserves. The outcome of the present war will be a great reduction of immigration; the people of Europe will be needed at home. The birth rate in the United States has declined almost to the extermination of the native stock. The immigrants have supplied the birth rate until now. Now we are sending infants to institutions and killing them off from 40 to 70 per cent.; 50 to 90 per cent. of those under six months. This condition of affairs may be corrected if it is treated from the scientific standpoint. The institutions have failed so far in the care of young babies and children. In one of the best institutions in this city sixteen children were taken at random and it was found that eight had suffered from rickets, although they should be thankful that they had survived. Now, 50 per cent. of children with rickets is something you will not find in the tenements.

In orphan asylums the children, compared with children in the tenements, are much inferior both physically and mentally. A few years ago the Municipal Research Bureau of this city sent an anthropologist from Columbia University to investigate 1000 children. These children were found to be four years retarded in physical development in height and in weight, as compared with poor children taken at random on the lower East Side. Those children were examined in one of the best institutions, under the best conditions. I have made careful observations on children discharged from institutions and find that they are shy, and fear people, and probably have a mental development of about three to six years behind that of children who have developed normally. So you see Dr. Chapin is doing a most remarkable work, when he keeps dependent children out of institutions.

Just permit me to say that if one went by Miss Wald's figures, and she has been more conservative than the facts warrant, she still has a mortality rate infinitely lower than that of the best hospitals, and she exerts an influence on these children morally, physically and from the pathological standpoint. She should be encouraged by our profession.

DISCUSSION ON DR. CHAPIN'S PAPER.

Dr. Alfred F. Hess said: Just a word as the hour is late. What I wish to bring out is that if we wish to compare these two systems, the institutional care of children and the boarding out plan, we must compare them at the same level. It is not fair to take a composite list of figures from the worst institutions and compare them with the figures, for instance, of the Sage Foundation Babies' Experiment or with the results of the Speedwell Society's work. If we wish to make a comparison of this kind we must take things at their best.

I have been interested in Dr. Chapin's Speedwell work and have here the reports covering a number of years. In going over the records of twelve or thirteen years we find that there is a mortality of 33⅓ per cent. in children under six months of age and of 13 per cent. between six and twelve months. During the last year the mortality has been 16 per cent., for the babies under six months of age. Still the cases are very few in number, not more than fifty in a whole year, which is hardly an experiment that can be considered applicable to New York City. There were only twenty-seven cases treated under one year. That is all very well but it cannot be compared with the cases here in institutions. I do not know whether it would be applicable if we took 1000 cases and boarded them out properly. Or again take the Sage Foundation; there were only ten babies for each physician and yet the mortality was 46 per cent. That is not a fair comparison.

Commissioner Kingsbury spoke of 1000 infants in one institution dying in one year. I would like to ask him if some of those children were not boarded out. I think I know to which institution he referred and that they have been boarding out cases in considerable number.

Now as to the institutional cases. There is something to be said for the institutions. Last summer there were more cases of infantile paralysis throughout the city than in the institutions. By means of the Schick test and toxin antitoxin injections we have practically eradicated diphtheria from our institutions.

As to the question of vermin, they are not characteristic of institutions. In the Tuberculosis Preventorium this has been such a serious problem among children that come from homes that we have to employ a nurse who does nothing but care for the heads of children entering the institution.

The commissioner said something to the effect that institutions were not good enough to care for healthy children but he thought the pretuberculous children could well go to institutions. In other words what was not good enough for the well child was good enough for the undernourished.

Whether the people come from other cities to leave their children in our institutions has nothing to do with the question, nor has the problem of mothers surrendering their infants.

A third method of caring for dependent infants has been mentioned, that is the plan of giving a child to its mother and paying the mother to care for it; this is better than either of the other methods.

Dr. Chapin, in closing, said: These figures are averages which it is perfectly fair to take and those of the State Board of Charities which are official; it is certainly a fair thing to quote averages.

Dr. Hess failed to mention the cases of gonorrheal vaginitis, scarlet fever and other infections contracted in institutions. I would like to ask him about these.

In the earlier years I sent out all kinds of diarrheas and toxic conditions, and there is not a single case of that kind that would not have died in an institution. But we have found that it is not wise to send acute toxic cases. However, the marasmus cases on the bottle we do send out, and we have obtained a mortality of 16 per cent. under six months which is better than can be shown in any institutional work dealing with this class of cases.

I do not board out babies as some institutions do, giving them to some poor woman and then seeing them once a year, so that is not a fair comparison. My mortality certainly compares very favorably with the 100 per cent. mortality of this class in institutions. I believe that boarding out should be systematized and properly managed; if you take marasmus babies and board them out and get a mortality of only 16 per cent., under six months you are doing very well; also the morbidity is a thing of very great importance.

Then in the institutions there are the epidemics to be considered. I think Dr. Hess is now having an epidemic of measles in the institution with which he is connected. I think they had an epidemic last year and this year. In over 1000 cases I have had only three cases of measles in five years and then the disease has not spread to others. We know that measles is often followed by tuberculosis in feeble children.

Dr. Hess said: That question of vaginitis comes up so frequently. Vaginitis is not a disease of institutions, but one that is found throughout the tenements. We have refused admission, on this score, to one-third of the female infants who have applied; almost all who have been refused have been rejected because of vaginitis. These do not come from institutions but they do come from homes. As a result of these rejections the population of our institution is two-thirds boys and one-third girls. Now as regards measles we have had measles in the institutions, but this audience have all had measles and they were not institutional children. Children get measles at home.

Dr. Chapin replied: You confess that you have vaginitis in your institution and yet you do not take in children having this infection. Now the child that has vaginitis at home does not spread the disease, but when you have this in institutions it is spread. That is just the crux of the whole business.

COMMISSIONER KINGSBURY said: In speaking of the mortality in the institutions, I had more in mind the saving of lives by leaving the children with their mothers. I was not referring to the boarding out system versus institutional care. I simply wished to emphasize the matter of providing means whereby children could be left with their mothers. It is true the institution to which you have referred does board out children and sees them once a year. That form of boarding out is only jumping from the frying pan into the fire. I do not want to have children boarded out unless they are given as intensive care and supervision as Dr. Chapin has described, and I do not propose to board children out unless they are given this intensive care.

So far as the vermin are concerned, they are in the homes as well as in the institutions, but I would invite the inspection of five or six hundred homes where we have boarded babies. We have made an inspection of these homes and not one was reported as harboring vermin.

MISS WALD said: I would merely emphasize that our experience has been that the chances of recovery are infinitely greater if the patient is well cared for in his home than if in a hospital. We have been unfortunate in sending girls to an institution and having them contract vaginitis. The children we have cared for have in most instances made recoveries without complications. Our visits to the homes are of great educational value to those homes, especially from the standpoint of infant mortality. What I have told you of pneumonia is true of other diseases.

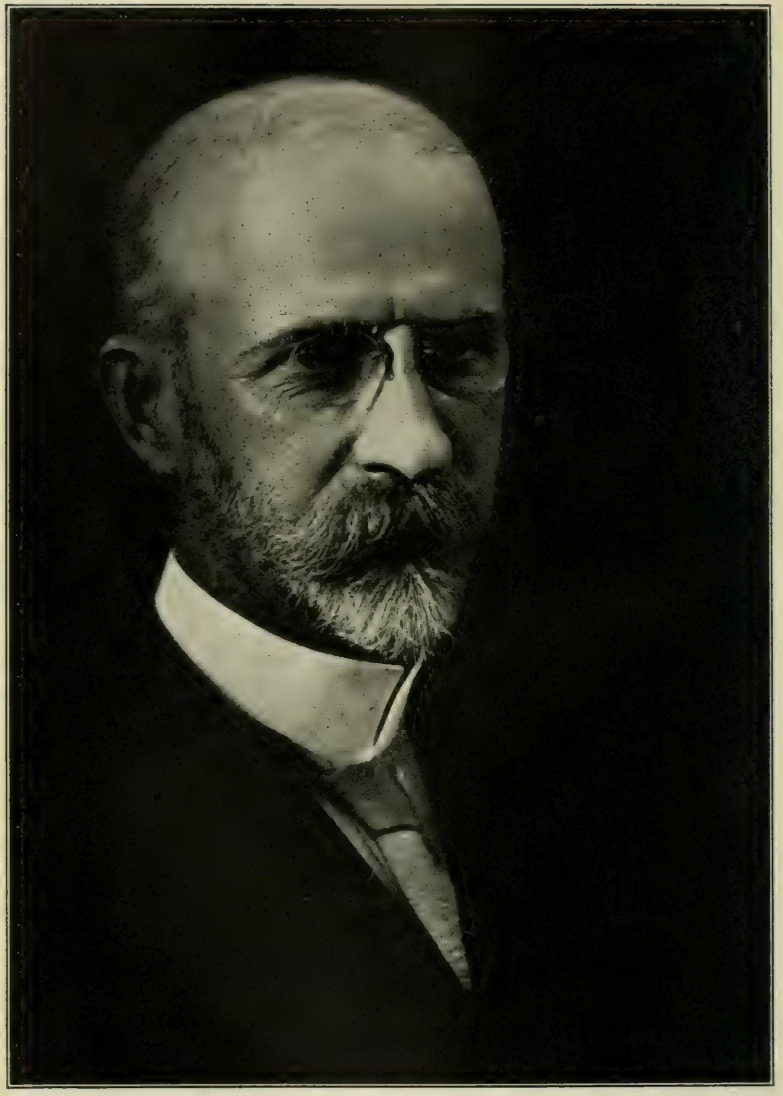
BRIEF OF CURRENT LITERATURE

DISEASES OF CHILDREN

Pemphigus Neonatorum.—F. H. Falls (*Jour. A. M. A.*, 1916, lxvii, 1522) records the occurrence in the hospitals of Chicago of eight small epidemics of pemphigus neonatorum within the last year. The disease is an epidemic staphylococcic vesicular dermatitis occurring usually in new-born babies from the fourth to the fourteenth day, but capable of being transmitted to older children and adults. The onset of the disease is usually from the fourth. A reddened area of hyperemia first appears, which becomes whitened in the center in a few hours, followed by a raising of the epidermis into a thin-walled, wrinkled vesicle containing a clear, yellowish fluid. Later this fluid becomes turbid. Smears from this show pus cells with intracellular and extracellular diplococci, which in these preparations resemble the gonococci very closely, but differ in that they are gram-positive. The vesicles spread rapidly by peripheral extension, and in severe cases may coalesce to form large areas from which the superficial epidermis has been lifted off, leaving a raw, weeping, hyperemic base. There is, as a rule, no rise in temperature or increase in pulse rate. The babies eat and sleep well and gain in weight, and there seems to be little if any subjective sensation produced by the lesions. Fatal cases, however, occur associated with all the signs of a severe septicemia. In most of the reported cases of this type, skin lesions were present in the region of the umbilicus. The infection in these cases, therefore, probably spreads by way of the umbilical vessels. The disease is highly contagious, and can be transmitted through the medium of a third party. Prompt isolation of patients with quarantine of the obstetric wards until the last patient has left the hospital, followed by thorough fumigation and painting the infected wards and sterilizing material that has been exposed to the disease, appears to be the only efficient means of stamping out the infection. An efficient method of treating the lesions is to rupture the vesicle as soon as it forms and to apply 2 per cent. ointment of ammoniated mercury (white precipitate ointment) to the lesion.

Bacteriology of the Feces in Diarrhea of Infants.—Fourteen cases of diarrhea studied by W. R. Logan (*Lancet*, Nov. 11, 1916) were all on artificial diet at the time of onset. The flora of artificially fed infants differs from that of breast-fed infants chiefly in a decrease of the acid-tolerant group, an increase of the normal B. coli group, and in the appearance of membranes of the nonlactose-fermenting group along with some increase of cocci. The flora of infants suffering from diarrhea shows similar but more marked changes, and the more severe the diarrhea the more marked the changes. It is probable that the acid-tolerant group exerts a beneficent influence in restraining the growth in the intestine of the nonlactose-fermenting group. Bacilli of the nonlactose-fermenting group were obtained from six out of twenty-one (28.5 per cent.) infants and young children who were free from diarrhea. Bacilli of this group were isolated from eleven out of fourteen cases of diarrhea (78.5 per cent.). Bacilli of Morgan's No. 1 group were isolated from 9 per cent. of the normal children, and from 35 per cent. of the cases of diarrhea. True, though nonagglutinable, dysentery bacilli were isolated from none of the normal children, but were obtained from three cases of diarrhea with blood and mucus (dysentery), or 21 per cent. of total diarrhea cases. A certain number of cases of diarrhea of infants are therefore true bacillary dysenteries, even in Scotland and in winter-time. It is doubtful whether the overgrowth of nonlactose-fermenting bacilli initiates the diarrhea, or whether it is a secondary and aggravating factor.

Treatment of Diphtheria Bacillus Carriers.—A. J. Bell (*Arch. Pediat.*, 1916, xxxiii, 836) says that the kaolin treatment, or the various local applications, may be tried first because of their simplicity, especially in private homes, but the desired result is not accomplished quickly; average time in series over six days. In all probability it is much inferior to the staphylococcus spray in nasal cases. The broth culture of the staphylococcus pyogenes aureus, when applied properly from a laboratory and clinical standpoint, is a safe and successful method of combating the carrier problem. Each of the writer's series became negative in twenty-four hours when a dependable broth culture was used.



BROOKS HUGHES WELLS, M. D.

BORN JULY 28, 1859 DIED JULY 6, 1917

THE AMERICAN

JOURNAL OF OBSTETRICS

AND

DISEASES OF WOMEN AND CHILDREN.

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IN MEMORIAM.

DR. BROOKS HUGHES WELLS.

BROOKS HUGHES WELLS, M. D., Editor of the AMERICAN JOURNAL OF OBSTETRICS, died on July 6, 1917, following an injury received while riding his wheel. It is with deep regret that the untimely passing away of the senior editor of this Journal is announced to the readers of the same, to his many medical friends and to the profession at large. There is nothing that the words of a mere formal obituary can add to the record of one whose standing and attainments were so well known in the profession and who was so universally respected and beloved by his colleagues. The undersigned is prompted, however, by several years' close association with Dr. Wells as co-editor, to place on record in the pages of the publication with which he was actively associated for over a quarter of a century, this brief appreciation, incomplete and unworthy though it may appear, and to give expression to the deep sorrow and the sense of personal loss which his sudden death has caused.

Dr. Wells was the son of the Rev. Edward Livingston Wells and Mary Huder Hughes Wells. He was born on July 28, 1859, and after his preliminary education, was graduated from the College of Physicians and Surgeons of New York in the Class of 1884 and served an interneship in the City Hospital on Blackwell's Island.

Dr. Wells was Professor of Gynecology for many years at the New York Polyclinic Medical School and Hospital and likewise Associate Visiting Surgeon at the Woman's Hospital; Consulting Physician to the Beth Israel Hospital of New York City and the Brattleboro Hospital of Brattleboro, Vt. He became a Fellow of the American Gynecological Society in 1902 and was elected one of its Vice-Presidents at the last meeting held in Pittsburgh in May,

1917. He was also a member of the New York Obstetrical Society, the American College of Surgeons, the American Medical Association, the Academy of Medicine, and was President of the Medical Society of the County of New York in 1913–1914.

Dr. Wells was married in 1885, to Miss Mary Frances Pomeroy, who together with a family of four daughters survive him.

In 1892 Dr. Wells became the editor of the AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN and continued his active association with this publication until the time of his death. He was the friend and successor of Dr. Paul Mundè and his connection with the Journal is marked by an adherence to the high standards established by his predecessor. As an editor he was most attentive to his duties; his intercourse with contributing authors courteous and punctilious and his editorial decisions characterized by honesty and a singleness of purpose. Dr. Wells was a firm believer in the assumption that gynecology and obstetrics constituted one of the foremost and important specialties of medicine and his professional practice was consistent with this belief. His quiet manner, his unfailing courtesy, his modesty and his good surgical judgment endeared him likewise to his associates in the profession and to his patients, and served to establish him firmly in the specialty which he devotedly followed for so many years.

Dr. Wells was greatly interested in the work of the Medical Reserve Corps and became a member of the same several years ago. Notwithstanding his age and the demands of his family and practice, he nevertheless accepted a commission and a few months ago was assigned to active service in the examination of recruits for the Corps. Without giving expression to the same, Dr. Wells nevertheless felt keenly his responsibilities to the service in which he had enlisted and was ready to respond to the call for active duty when this came. His decision and action should constitute a noteworthy example to the younger men of the profession, of patriotism and devotion when the country calls for the services of its medical men. Although devoted to a specialty far removed from the domain of military medicine and surgery, Dr. Wells bravely shouldered the work and regularly took a part in the necessary drills and other methods of instruction. He was commissioned a captain in the Medical Officers Reserve Corps only a few months ago and expressed a desire before his death to be laid away in the uniform of his rank. The wish was granted.

The achievements which mark the life-work of a man may vary widely in their manner of expression in individual cases. In one instance they are distinguished by brilliancy, by an appeal to popular acclaim, by notoriety, perhaps by characteristics more evident to the eye and ear than to the mind. The good works of another may be of equal worth and yet we find them marked by a quiet dignity and honesty of purpose which nevertheless commands the attention and respect of all. The former may be likened to a swiftly moving stream with numerous rapids and whirlpools tossing noisily and impressively on its way, while on the other hand a deep flowing, quiet, majestically moving river with scarcely a ripple to disclose its motion, accomplishes an equal good and subserves perhaps a more manifold and useful purpose. Dr. Wells to his friends and co-workers was the quiet, dignified gentleman, whose conduct with his professional brethren was characterized by patience, forbearance, and a willingness to extend help wherever needed. It is by these qualities that he endeared himself to those about him, whether professional friends or patients, and it is these characteristics which will keep fresh his name in the memory. His work is done, it was well done, and as in the case of many other good and noble men, the world is better for his having been in it and of it.

Geo. W. Kosmak, M. D.

ORIGINAL COMMUNICATIONS.

THE VALUE OF THE AVOIDANCE OF SHOCK AND TRAUMA IN THE TREATMENT OF ECLAMPSIA.*

BY

EDWIN B. CRAGIN, M.D.,
New York City.

One of the questions seeking answer to-day is, Are we treating eclampsia with better results to-day than ten years ago? If so, why?

In order to answer this question for himself the writer has been studying his records at the Sloane Hospital for Women, New York, where in 35,774 deliveries there were 389 cases of eclampsia. In this connection it should be stated that in this paper and in the records of the Sloane Hospital the term 'eclampsia' is applied only to cases of toxemia in which one or more convulsions have occurred either before, during or subsequent to labor.

It must be borne in mind that the mortality of any condition like eclampsia depends very largely upon the type of case received for treatment. Thus, a hospital service which is composed chiefly of patients who have been followed from early pregnancy in an antepartum clinic will have a much lower mortality than a service which opens its doors to all complications of obstetrics and becomes the dumping ground for neglected and perhaps moribund cases. For this reason the comparison of different series of cases in the same hospital service is often of more value than the comparison of a series of the same size from different hospitals.

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*Read at the Meeting of the American Gynecological Society at Pittsburgh, May 31, 1917.

To answer the question, Are the results in the treatment of eclampsia better than formerly? the writer would compare the first series of 20,000 deliveries at the Sloane Hospital in which accurate records were kept with the last series of 15,774 deliveries. In this first series of 20,000 deliveries there occurred 251 cases of eclampsia, and in this series the maternal mortality was 71 or 28.3 per cent. The fetal mortality including stillbirths and those dying before the mothers left the hospital was 151 or 60.15 per cent. In the last series of 15,774 deliveries there occurred 138 cases of eclampsia and in this series the maternal mortality was 20, or 14½ per cent. The fetal mortality including stillbirths and those dying before the mothers left the hospital was sixty-two, or 44.9 per cent. In comparing the methods of treatment pursued now with those of ten years ago, certain striking differences are evident. One of the first changes in treatment which brought about a marked drop in both maternal and fetal mortality was the substitution of ether for chloroform in the treatment of all toxemic patients. Attention was called to the importance of this change in a paper presented to the American Medical Association by the writer in conjunction with Dr. Edward T. Hull, of New York, in June, 1910. The knowledge that chloroform produced in the liver changes similar to those of toxemia made the further use of chloroform in toxemia illogical and its discontinuance a great gain in the treatment of eclampsia.

In the second series of 15,774 deliveries as in the first series of 20,000 deliveries, the occurrence of a convulsion in the course of a toxemia has been considered an indication that the pregnancy should not be allowed long to continue and yet in the second series as compared with the first there has been a great difference in the urgency with which the interruption of the pregnancy was considered indicated. As the writer studied posteclamptic cases during the first week of the puerperium he became impressed with the fact that the patients had passed through a severe shock; they were anemic and showed their physical depression in many ways. The fact that chloroform had duplicated the lesion in the liver and added another shock easily explained the lower mortality following the discontinuance of chloroform. The fact that interruption of the pregnancy was good treatment in eclampsia had been well established by years of experience, but how about the method and speed of this interruption? In my first series many of the cases were delivered by accouchement forcé soon after they entered the hospital, and as I look back upon them now, the impression deepens that more would have been saved if the indication to empty the uterus had not been considered so urgent. The cervix was often long and rigid. The mechanical dilation with a metal dilator followed by stretching with the fingers, followed by a tear of the cervix, perhaps quite extensive, followed by a forcible extraction certainly added greatly to the shock from which the woman was already suffering. In the second series and as now practised at the Sloane Hospital the occurrence of an antepartum convulsion is as formerly considered an indication that the pregnancy should be terminated, but terminated in a way which will give the least shock and trauma to the patient. Furthermore, during all efforts at terminating the pregnancy, the toxemia is treated by favoring elimination and the nervous system is quieted.

Let us suppose for a moment that a patient has just been brought into the hospital with the history that she has had two or three convulsions. She has a high blood pressure; a high percentage of albuminuria; is semiconscious and restless. She is pregnant anywhere from six to eight months. What is the best treatment as shown by a lessening mortality in recent years? Our experience and results at the Sloane Hospital for Women would seem to indicate that the object desired is the termination of the pregnancy but a termination with the least shock and trauma possible.

The general plan of treatment has usually comprised three features:

1. The cervix has been softened and dilated and the labor started by a Voorhees elastic bag.

2. Elimination has been favored by a colon irrigation of 9 gallons of saline or soda solution. The writer has been unable to determine that glucose solution had any advantage over the preceding. Occasionally a hot wet pack is given.

3. The nervous system has been quieted by the administration of chloral per rectum. If the patient has been very restless, morphine has been administered hypodermatically.

The above may be taken as the typical routine treatment and much stress is laid on the fact that the toxemia is being treated while the cervix is being softened and dilated, the former to have the patient in better condition to stand the shock of the delivery, the latter to lessen the shock and trauma at the time of the delivery.

Several questions present themselves regarding the method of delivery:

1. What is the field of vaginal Cesarean section or vaginal hysterotomy in the delivery of an eclamptic patient?

When it was considered imperative in the interest of the eclamptic mother that the uterus should be emptied as soon as possible, after the occurrence of a convulsion, it was thought that vaginal hysterotomy would prove to be just the procedure desired. The consultant called out of town to a case of eclampsia could, at a single sitting, whatever the condition of the cervix, empty the uterus; give directions as to the future care of the toxemic patient, and the baby, and return to the city. The expectations from vaginal hysterotomy in the delivery of eclamptics have not been realized. The operation in many cases has been found difficult. The cervix did not come down easily. It was difficult under sight to cut high enough to give sufficient room for the delivery and as a result the incision was extended by tearing during the delivery. This added to the shock from which the woman was already suffering and increased the mortality. For several years the writer has abandoned vaginal hysterotomy as a method of delivery in eclamptic women save perhaps those in the early months of pregnancy where fetal life was disregarded.

2. What is the field of abdominal Cesarean section in the treatment of eclampsia?

With the present popularity of abdominal Cesarean section it is natural that its use should be extended to eclampsia. It is an easy operation. It is surrounded by more or less glamour in the eyes of the laity. If the membranes are unruptured and vaginal examinations have been few and clean, the mortality of the operation itself is very low—less than 3 per cent. in skilled hands. The operation is unfortunately becoming too popular in the treatment of eclampsia and it is time to draw attention to its disadvantages and to outline its indications.

(*a*) The disadvantages of a Cesarean section in eclampsia. In eclampsia many of the babies are premature, are toxic and survive delivery but a short time. Our present fetal mortality at the Sloane Hospital for Women including not only stillbirths but those dying before the mothers leave the hospital is 44.9 per cent. Undoubtedly this mortality would have been lowered some if all these women had been subjected to Cesarean section for no method of delivery gives the baby so good a chance but the question is the wisdom of the procedure. To subject the woman to a Cesarean section with the probability that only about half of the babies will be alive at the end of the puerperium is discouraging work. Furthermore, during the procedures most indicated in the treatment of the toxemia after delivery, *i.e.*, the colon irrigations, the hot packs, etc., it is difficult to keep the abdominal dressing dry and clean. Again, it must be admitted that although the shock in a Cesarean section is usually not great, it cannot be entirely avoided and may turn the tide against the woman who has already been shocked by several convulsions.

Finally, it must always be borne in mind that a Cesarean section leaves a uterus with a cicatrix which may yield in a subsequent labor if this is at all difficult.

(*b*) On the other hand, there is a small group of cases in which a Cesarean section is the method of choice in the delivery of an eclamptic, and this group may be outlined as follows: A patient near term with a viable child and with a long rigid cervix, especially a primigravida.

In such a case it is often difficult to introduce a bag and after its introduction the uterus may be slow in dilating. Here the trauma of the dilatation coupled with the shock of the long tedious labor together with the risk of infection to which eclamptic patients are especially liable may all be greater than a Cesarean section performed promptly before vaginal manipulations. It is this group of cases to which the writer would limit the use of Cesarean section in the delivery of eclamptics.

There is one procedure much employed in the treatment of eclampsia with which the writer's experience would seem at variance, *i.e.*, venesection.

After numerous trials of it in his first series he has abandoned it entirely in his second. Eclamptic patients as stated earlier in the paper have subsequent to the convulsions so resembled patients in shock that venesection appeared illogical as lessening the resistance so much needed. They seemed to need all the blood they had and more too, and this led to the abandonment of the procedure with results which seem to have justified this action. In the cases where formerly venesection was considered indicated with a rapid, high tension pulse, veratrum viride has been used with good effect. In conclusion, the writer's experience leads him to treat antepartum and intrapartum eclampsia by delivery of the patient with the least shock and trauma possible, treating the toxemia at the same time. The treatment of postpartum eclampsia is chiefly that of the toxemia from which the patient is suffering.

10 WEST FIFTIETH STREET.

UTEROSCOPY VERSUS TRANSPERITONEAL HYSTEROTOMY.*

BY

ALFRED HEINEBERG, Ph. D., M. D.,

Associate in Gynecology in Jefferson Medical College, Obstetrician
to the Jewish Maternity Hospital, and Assistant Gynecologist St. Agnes and Mt. Sinai Hospitals,
Philadelphia, Pa.

(With one illustration.)

The methods employed in the diagnosis of intrauterine disease are undergoing almost the same changes which characterized the development of precision in the diagnosis of diseases affecting other hollow organs such as the bladder, rectum, sigmoid and esophagus. The physical means possessed by our medical ancestors for determining the nature of many diseased processes rarely extended beyond the tips of their fingers, or the fingers augmented at times by a metal probe. The information thus afforded was often inadequate, incorrect and misleading. The inaccuracy of their methods of physical diagnosis was however often overcome by a close study of the symptom-complex, an art which I fear is gradually being lost through our dependence upon modern methods of investigation. Emboldened by the perfection of aseptic technic and by a broader knowledge of anatomy the surgeon has invaded the cavities of the body one after another to lay bare their secrets.

Through the courage of his convictions, the directness of his attack and the clarity of his vision, he has created an inestimable fund of useful information, has substituted fact for fancy and destroyed conjecture with actuality. We do not forget, however, that like all pioneer work, the hewing of a path through the vast forest of medical ignorance has been attended by much risk and suffering which might have been avoided. Following the period of direct surgical attack for the purpose of diagnosis there has dawned the era of diagnostic precision through the use of instruments. These have the advantage of supplying fully as much, ofttimes more information than a surgical exploration, with distinctly less risk and discomfort to the patient. Only those cavities which open directly upon the surface of the body, or are easily approached through a canal which opens upon the surface, lend themselves to investigation with the modern diagnostic instruments. The cystoscope, proctoscope, sigmoidoscope, bronchoscope, esophagoscope and ureteral catheter have rendered remarkable service in the elucidation of obscure and important symptoms which could not, in most instances, be deciphered with greater certainty or with as little danger by any other means. There are few if any of us who would to-day substitute cystotomy for cystoscopy, or who would neglect the employment of the ureteral catheter to obtain information concerning the condition of each kidney before resorting to nephrotomy. By demonstrating in many cases that the operations were not necessary or that the pathologic processes had advanced beyond the aid of the surgeon's scalpel, the bronchoscope and esophagoscope in the hands of the expert have reduced the percentage of mutilating and fatal operations which were undertaken for the purpose of diagnosis.

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* Read before Meeting of the Harlem Medical Association, New York, April 4, 1917.

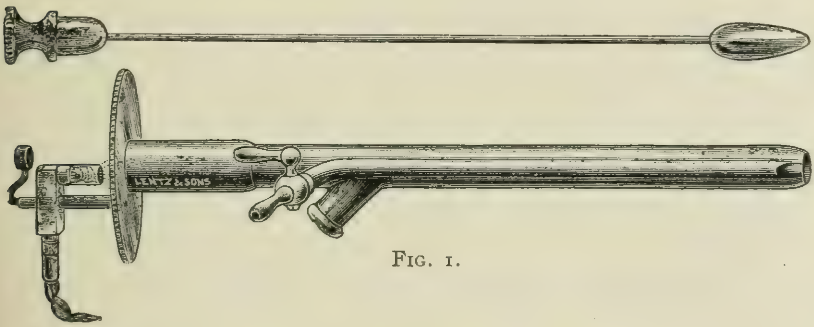

FIG. 1.

The value of these instruments in their respective fields may be equalled by the uteroscope in the diagnosis of intrauterine diseases. The object in presenting this instrument before you is to acquaint you with its usefulness and more especially to set forth its advantages over transperitoneal hysterotomy in intrauterine diagnosis. A convincing demonstration of the value of uteroscopy in determining the causes and directing the treatment of obscure intrauterine lesions, should do much to combat the growing tendency toward the performance of diagnostic hysterotomy. Such a demonstration is within the reach of anyone whose skill and aseptic technic would justify the performance of dilatation of the uterus in properly selected cases.

Those who follow the teaching of one of our most distinguished surgeons in advocating transperitoneal hysterotomy for the purpose of establishing "a prompt and certain diagnosis when a reasonable suspicion exists of malignant disease of the uterus" and who extend its performance to "clearing up the exact condition (within the uterus) in many cases now beyond our diagnostic powers" are likely to ignore other methods of diagnosis and resort too frequently to an operation which is not without risk. A critical study of the twenty-seven cases in which hysterotomy was done for the purpose of diagnosis by its most ardent advocate will do much to prove the correctness of my assertion.

The findings were as follows:

(*a*) Retained products of conception	15
(*b*) Chronic hyperplastic endometritis	6
(*c*) Benign polyp of the endometrium	3
(*d*) Chorioepithelioma	2
(*e*) Early carcinoma of the fundus	1
Total	27

The fifteen cases of retained products of conception represent 55 per cent. of the total. Dr. Deaver's own comment on these cases is as follows "I would naturally wish to avoid hysterotomy in these cases, but the circumstances were such that pregnancy did not seem a probable explanation of the symptoms. Such errors are possible under this method of procedure, but in extenuation it may be said that not one received any apparent harm from the operation and departed cured." Dr. Deaver does not report in full the history of any of these fifteen cases, but gives the partial history in five of them as follows:

Case I.—Three months pregnant, retained secundines, double bilateral tubal disease. Hysterotomy and removal of the appendix.

Case II.—Three months pregnant. Hemorrhage. Hysterotomy, degenerated placenta. Removal of appendix.

Case III.—Dilatation and curettage six months previously. Uterine hemorrhage. Hysterotomy, degenerated placenta. Appendectomy.

Case IV.—Three months pregnant. Painless hemorrhage. Hysterotomy, degenerated placenta. Removal of appendix.

Case V.—Two months pregnant. Painless uterine hemorrhage, very anemic and cachectic. Hysterotomy and removal of the appendix.

If these may be taken as an index to the entire fifteen cases it would appear that operative cleverness has been substituted for diagnostic care and acumen. It is difficult to conceive how the merest tyro in medicine, much less such a master in the art, could so often confuse the hemorrhage of incomplete abortion with that of carcinoma of the fundus uteri, especially if the history of the case points, as in those reported, to an existing pregnancy of not more than three months' duration.

Chronic hyperplasia of the endometrium (six cases) presents greater difficulties in diagnosis than does retention of the products of conception. The irregular uterine hemorrhage which it produces during the approach of and, more especially, after the menopause may be easily confused with that due to malignant neoplasms of the fundus uteri. After we have exhausted the usual methods of examination such as intrauterine digital exploration, curettage, and microscopic study of the scrapings, there still remains in many of these cases, a reasonable doubt as to the true nature of the pathologic process. Undoubtedly a visual examination of the interior of the uterus will in most cases reveal the difference between the thickened and softened mucous membrane of the hyperplastic endometrum and the circumscribed nodule or ulcer of cancer. The preferable procedure for obtaining this information, other things being equal, should be the one which exposes the patient to the least danger and suffering. This is particularly so, since the treatment of the endometrial hyperplasia consists in thorough curettage, no matter what the avenue of access to the uterine cavity may be.

A benign polyp of the endometrium is more easily diagnosticated than chronic hyperplasia of the endometrium. It may be immediately recognized on inspection of the uterine cavity and is readily distinguished from a carcinomatous ulcer or necrotic malignant growth. It is difficult, however, to distinguish a benign polyp from a small pedunculated carcinomatous nodule, as no macroscopic feature of one is sufficiently characteristic to permit of its unequivocal differentiation from the other. The final decision in such cases must rest upon careful microscopic examination of the excised tumor. What may be accomplished, however, by inspection is to determine the precise location of the tumor and thus insure its complete removal. This may be as accurately done with the uteroscope and a sharp curet through a dilated cervix as through transperitoneal hysterotomy.

So far as treatment alone is concerned only the three cases of malignant tumor of the uterus, constituting 11 per cent. of the series reported by Deaver, would have required more radical measures than the thorough application of the curet or placental forceps. The insidious and malignant nature of carcinoma and chorioepithelioma of the corpus uteri justify the adoption of any measure, no matter how radical which would lead to their early recognition and prompt extirpation. Hysterotomy is peculiarly serviceable in such cases, because it meets both of these requirements, inasmuch as the operative procedures necessary to expose the interior of the uterus may be immediately utilized in the performance of hysterectomy. It is *only* in these cases however, that the treatment best adapted to the removal of the pathologic lesion necessitates invasion of the peritoneal cavity; in all others, as already pointed out, fully as much may be accomplished by less dangerous methods of treatment, after the nature, location and extent of the pathologic process has been determined.

In spite of the absence of any fatality in the patients subjected to hysterotomy, some of them must have suffered complications and sequelæ such as massive pelvic adhesions as reported by Hirst, which could have been avoided by other methods of diagnosis and treatment. Every invasion of the peritoneal cavity is attended by the risks of infection, inflammation and adhesions, and there is no surgical skill so great, or aseptic technic so perfect as to totally eliminate them. We agree with the advocates of hysterotomy that the methods previously employed in the diagnosis of intrauterine disease afforded at times inexact and inadequate information. The doubt, in which we were left, as to the true nature of the existing disease and the fear of its possible malignancy lead to unnecessary removal of the uterus with occasional fatal result. We agree also "that the best way to attack a pathological condition and unfold a puzzling symptom-complex is to expose the afflicted parts to the eye of the surgeon." This may be accomplished, in uterine disease, by means of the uteroscope. Precision in diagnosis and the avoidance of the risks incurred by unnecessary hysterectomy were the incentives which lead to its invention.

Uteroscopy occupies a position midway between the conservatism and inaccuracy of the older methods of diagnosis and the radicalism and inherent dangers of transperitoneal hysterotomy. Its advantages over transperitoneal hysterotomy may be stated as follows:

1. It affords a perfect view of the interior of the uterus without subjecting the patient to the dangers attendant upon invasion of the peritoneal cavity.

2. It may be performed quickly under nitrous-oxide-oxygen anesthesia.

3. The patient experiences no more pain or discomfort than after an ordinary dilatation and curettage.

4. It affords a clear view of the *cervical canal* as well as of the uterine cavity.

5. The dilated cervical canal insures good postoperative drainage from the cavity of the uterus.

6. It will demonstrate that a very large proportion of cases of obscure intrauterine disease (89 per cent. of the series reported by Deaver) are nonmalignant and may be efficiently treated by the curet or placental forceps and thus avoid a maximum of cure for a minimum of disease.

1642 PINE STREET.

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INFECTIOUS ABORTION OF CATTLE AS A COMPLICATION OF PREGNANCY OF WOMEN.*

CASE REPORTS OF ELEVEN CASES OCCURRING IN WOMEN, TWO EPIDEMICS IN CATTLE AND EIGHT CASES IN DOGS.

BY

HENRY P. DE FOREST PH. B., M. S., M. D.,

Adjunct Professor of Obstetrics, New York Post-Graduate Medical School; Chief Medical Examiner Municipal Civil Service Commission,
New York City.

INTRODUCTION.

IN a paper which is to be read before sympathetic and critical friends, certain personal observations may be permitted which would be out of place were the paper to be presented to an audience whose members meet upon a purely scientific basis. Since, therefore, at the request of your President, I am to read a paper to my colleagues of the Society of the Alumni of the Sloane Hospital for Women, a few words by way of personal preface and explanation may not be out of place.

After his graduation at Cornell in 1884, and a period of incubation two years in length as a teacher in a high school, the writer in 1886 definitely decided to return to his Alma Mater and take graduate work for a second degree in what was then known as the Medical Preparatory Course. It was his singular good fortune, during the year that followed, to be thrown in more or less intimate association with men who have since attained national distinction in their respective fields of scientific research.

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*Read before the Society of the Alumni of the Sloane Hospital for Women, January 26, 1917, and before the Methodist Episcopol Hospital, February 22, 1917.

Leland O. Howard, United States Entomologist; Theobald Smith Director of the Rockefeller Institute for Medical Research at Princeton, Leonard Pearson, the State Veterinarian of Pennylvania; Frederick V. Coville, the United States Botanist; and Veranus A. Moore, Director of the New York State Veterinary College, were among his immediate undergraduate associates. In the faculty itself it was his good-fortune to have as his chiefs in his major and minor subjects John Law, at that time the foremost veterinarian of America; Burt G. Wilder, distinguished for his work on the Morphology and Anatomy of the Brain; John Henry Comstock, Professor of Invertebrate Zoology; and Simon H. Gage, Professor of Embryology. Five years spent in more or less intimate relations both in work and play with men of this caliber could not fail to stimulate interest in many lines of scientific investigation other than the classical subjects of human medicine.

Especially did the work in comparative anatomy with Professor Law arouse an interest in the anatomy of the domestic animals, and in the numerous diseases, such as anthrax and glanders, which affect the domestic animals chiefly, but which in isolated instances are also known to claim human beings as their victims. Later, in the National Bureau of Animal Industry in Washington, the writer was again thrown in close relations with Dr. Theobald Smith and Dr. Moore, and during the quarter of a century which has elapsed, the continued personal friendship of such distinguished men has of necessity directed his thought from time to time to subjects of medicine that relate to both men and animals.

These facts may serve to explain why the attention of the writer was drawn to certain clinical conditions which he has observed in his patients and which form the basis of this report. These conditions, so far as the writer is aware, have not been previously reported to the medical profession, but have doubtless occurred from time to time, and have their exact analogs in certain well-recognized epidemics affecting the domestic animals.

The history of these cases are well worth consideration by a body of men who have had specialized training in a maternity hospital, and I present them to you for discussion in the belief that they represent a class of infection occurring in the pregnancy of certain women, which corresponds exactly to the disease well-known to veterinary surgeons throughout the country under the title of "infectious abortion of cattle."

REPORTS OF ELEVEN CASES OCCURRING IN WOMEN.

CASE I.—Mrs. M. H., first came under my professional care in April, 1908. She had been married in 1905 at her home in London, and in 1907 her first child, a boy, was born after a short and normal labor. She was again pregnant when I first saw her, but her pregnancy was an uneventful one. She spent the summer in the country, returned to the city late in August, and on the 31st of that month labor was induced because of a moderately contracted pelvis. At the end of nine hours a female child was born; the mother's recovery was uneventful, but the child had a severe attack of icterus neonatorum which lasted for about four weeks. At no time did the mother's temperature rise above 99° F. The placenta was normal, and there was no evidence of maternal abnormalities at that time.

She became pregnant for the third time in the spring of 1914, and was under my observation throughout her pregnancy. No abnormalities were observed. She spent the greater part of the summer in the country, as before, and came to the city from time to time for observation. When seen on the 26th of November the fetal movements could be plainly felt though they were somewhat sluggish. From her menstrual history (March 17) her confinement was expected on the 24th of December, but on the 18th of December she came to the city, since for the preceding ten days she had noticed that she no longer "felt life." Examination showed that the child was large, but no fetal heart sounds could be heard. Her labor began in the early morning of the 19th, and lasted throughout the day. The pains were not strong, but occurred at regular intervals. At nine in the evening her baby was born. Throughout the second stage of labor it was noticed that the presenting head had an unusually soft and doughy feeling, and that the fontanelles were indistinct. No rotation, either of the head or of the trunk occurred. So unusual was the sensation given to the examining finger that a monstrosity of some sort was suspected. When the child was born, the explanation was quite evident, since the baby was not only dead but so badly macerated that the skin had separated from the body. The child weighed 8 pounds and 9 ounces. The head was uniformly molded into a conical mass, and though the bodily frame was large the flesh was soft and of a deep purple color.

The cord was of normal length, and once around the neck. It was 2 inches thick in places, very edematous, swollen and was also deep purple.

The placenta was almost white, with a yellowish tinge. It had entirely separated from its uterine attachment, and the maternal surface was covered with a smooth firm fibrous layer of new connective tissue. There were numerous band-like partitions of the same material throughout the placental structure. The separation must have progressed gradually, since no evidence of intrauterine bleeding was found. It was 20 × 18 cm., and weighed 22 ounces. The liquoramnii was moderate in amount, dark brown in color and very viscid but no free blood was present. Manual intrauterine examination showed that the placental site was quite healed.

After the birth of the child and the almost immediate spontaneous delivery of the placenta, a hot intrauterine douche (116°) was given of 1:5000 bichloride. The uterine walls were extremely thick, and though contractions occurred, the fundus for several days was at the level of the navel and suggested an intramural fibroid. A tight breast binder and free saline catharsis prevented much mammary discomfort, and the mother's puerperium was uneventful. Temperature, pulse and respiration were normal throughout the first three weeks, but the large size of the uterus and its slow involution caused me to keep the patient in bed until the eighteenth day (Fig. 1). On the 18th of February the following note was made. "The uterus is anteverted, well involuted, not tender. Both ovaries are in normal position. Neither of them is enlarged. There is a slight laceration of the cervix. This extends backward and to the left. There is a moderate vaginal discharge. The perineal muscles are not affected. The uterine tumor which was present at the time of the birth of the child has entirely disappeared."

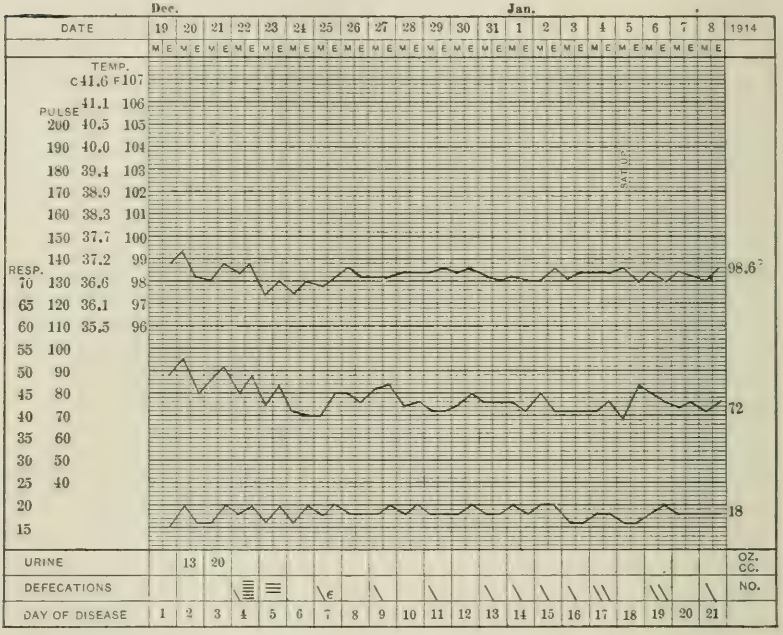

FIG. 1.—Temperature chart, puerperium, Case 1.

Of course the question at once arose as to why a child so well-developed should be destroyed *in utero* by a progressive but complete separation of the placenta from the uterine wall without any injury and without any intrauterine hemorrhage. The possibility of an unsuspected syphilitic infection was at once considered as a possible explanation, and both parents readily accepted my suggestion that a Wassermann test be made to determine without a question, the presence or absence of this factor. Both tests were made by Dr. Frederic C. Sondern, and both were negative. No adequate cause could at that time be given to explain the occurrence of a stillbirth of this unusual type in a woman who hitherto had appeared to be in excellent health.

Not long after my patient had recovered I had occasion to go to Ithaca, and as usual, when an opportunity offers, I spent some time in the laboratories at the university. One of the first things which I found in the way of new material in the medical department was a large tank filled with preservative solution in which were stored a considerable number of uteri and of fetuses of various domestic animals, principally cattle, which had died as a result of infectious abortion. The subject to me was a new one, and as it was related to human obstetrics in a rather distant way I was much interested in learning, as much as time would permit, something of the etiology and pathology of this disease. The more I heard from my friends at Ithaca of the lesions caused by the *B. abortus* in the domestic animals, the more I became convinced that these lesions and the clinical picture to which they gave rise was similar in every particular to the symptoms and ultimate result in the patient whose history I had just narrated. Although definite instances of actual infection of women by this microörganism had not been reported, I made a direct inquiry from Dr. Veranus A. Moore, Director of the New York State Veterinary College at Cornell University, concerning the appearance of infectious abortion in women. His reply was as follows: "So far as I am aware there is no evidence of the human subject suffering from *B. abortus* described by Professor Bang. It is not impossible that such is the case, but I feel it would have to be demonstrated. Some years ago there was more or less anxiety expressed concerning the possible transmission of this trouble from cattle to the human subject, but so far as I know no evidence of it has been forthcoming."

It did not seem probable that I would again have an opportunity to observe another instance of this rare infection in a woman patient, but I was mistaken as the following case report will show.

Case II.—In the early part of 1916, Mrs. H. again came to my office and her history and examination confirmed her belief that she was pregnant. Her last menstrual period began on the 8th of November, 1915; the expected date of labor would, therefore, be the 15th of August, 1916. She lived in the city during the winter and early spring of this year. Her pregnancy, with the exception of a mild attack of epidemic influenza in February, was uneventful. Regular examinations of the urine were made, but no abnormalities were discovered. Her home life and the care of her two children occupied her time without undue fatigue, and, in May, she returned to her country home in the northwest corner of Connecticut to spend the summer. She expected to return to the city at the time of her confinement, but the violent epidemic of infantile paralysis which occurred in New York in the early summer made this inadvisable. At her summer home she lead an active out-of-door life and her general health remained excellent.

In view of her former experience it was determined to prevent, if possible, the recurrence of a stillbirth by the induction of labor about two weeks before the normal end of pregnancy. The development of the child *in utero* was entirely normal, and an examination made on the 23rd of July showed the fetal pulse rate was 140, strong and regular and that the child was already well developed.

On the 29th of July, I went to her home taking with me a competent nurse. With her assistance, the induction of labor was begun early the following morning. After a preliminary laxative and douche, an ounce of castor oil and an equal amount of glycerin were given. At 11.00 o'clock, without difficulty, the smallest (No. 1) Voorhees bag was introduced. The cervix admitted the tip of the finger and was soft and dilatable. The only change noted was that since the former examination, the fetal heart had dropped from 140 to 120 beats per minute. Within an hour after the insertion of the bag, slight uterine pains began, which increased in a perfectly normal manner. At 1.30, a No. 2 bag was inserted, which was expelled spontaneously at 5.50 P.M. At 6.10, bag No. 3 was inserted and the pains thereafter became stronger and more frequent until 9.00 o'clock in the evening, when this bag, in turn, was spontaneously expelled. The cervix was well dilated by this time and the membranes had remained intact. They were ruptured artificially. The liquor amnii was light brown, viscid and tenacious. A few moments later, the largest bag (No. 4) was used. From this time onward the pains occurred every three to five minutes and were entirely regular and normal. Shortly before midnight, this bag was removed and at 11.55 a baby girl weighing just 8 pounds was born by natural forces. The mother's condition throughout was excellent. The placenta was delivered in twenty minutes and a hot (116°) intrauterine douche of 1 : 5000 bichloride solution was given. The uterus contracted well. The amount of hemorrhage was very slight. At the end of an hour, the patient's temperature was 99.6°; pulse 108; respiration 22. So far as the labor itself was concerned, there was therefore no abnormality from beginning to end.

The pulse rate of the child remained noticeably low, although it could be heard without difficulty throughout the labor. After the baby was born, it made several attempts to breathe, and did breathe for a few moments in the hot bath in which it was immediately placed while artificial respiration was used. There was no obstruction to respiration, but slowly and steadily the child's vitality became less and less, and at the end of half an hour, from no apparent cause other than inanition, the child died.

A careful examination of the placenta showed that again there was a partial separation of the entire periphery of the placental tissue from the uterine wall. A circular area of about 2½ inches in diameter was the only adherent surface remaining. The placenta was pale yellow in color, extremely friable, and quite smooth upon its separated uterine surface where it was covered with a thin layer of firm connective tissue. The only placental area, therefore, through which the child obtained nourishment was restricted to the circumscribed central patch already described. The child's vitality was of necessity progressively diminished and this accounted for its inability to survive. It is probable that, had some method been available to determine the quality of the blood, it would have been found to contain large quantities of unoxidized materials which acted as toxins. There is little doubt that, had the pregnancy been allowed to continue for another two weeks, the placenta would have completely separated from its uterine attachment and a dead and macerated fetus would have been born, exactly as in her previous labor.

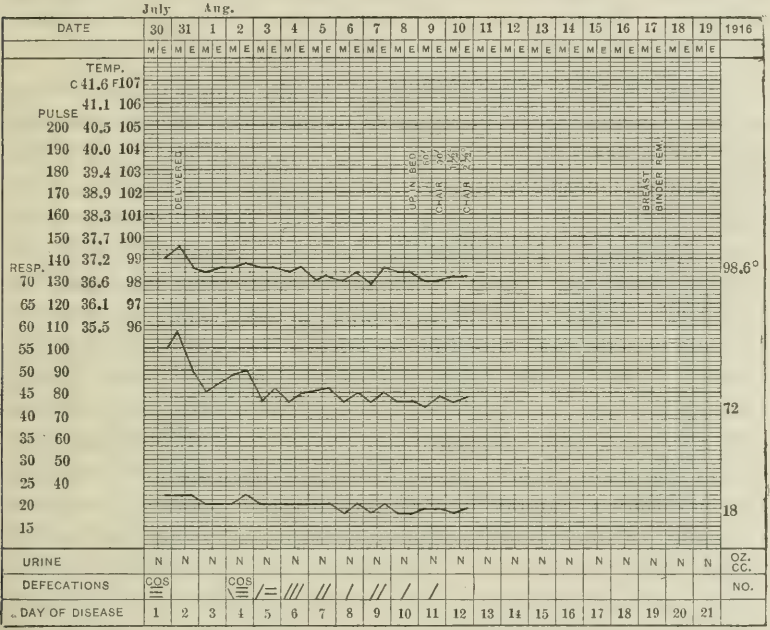

FIG. 2.—Temperature chart, puerperium, Case II.

The puerperium of the mother was quite uneventful. A tight breast binder was applied. The lochia ceased in a few days. There was no postpartal hemorrhage, and at no time after the first six hours did the temperature rise above 99°. The uterus involuted well, and on the tenth day, Mrs. H. was up and about the house as usual (Fig. 2).

By this time, the diagnosis of infectious abortion seemed to me to be reasonably clear. Daily douches of ½ per cent. lysol solution were given for a week, and thereafter, every second day, every third day, and finally once a week for the succeeding three months. The use of a permanganate solution as a regular disinfectant badly stains the underclothing, and for this reason, a coal-tar derivative was preferred. Whether this continuous vaginal antiseptic treatment would prevent further infection, was left for the future to decide.

During the short time of my stay at the summer home of my patient, I made careful inquiries as to the occurrence of infectious abortion in herds in the vicinity. The farm itself was stocked with well selected Guernseys and the cow barn and dairy had been thoroughly cleaned and whitewashed before the present owner's cattle were introduced. No difficulties had been experienced with the existing cattle, but shortly before the present owner purchased the farm, one of the former herd had slipped her calf nearly at term, and the calf was dead at the time of birth. No cause had been discovered. The Connecticut-New York boundary line passes directly through the farm, and while the Connecticut records that are available give no specific information as to epidemics of infectious abortion in that State, inquiry of the New York State authorities elicited the fact that a number of well-authenticated sporadic cases and epidemics of infectious abortion have occurred in this State within recent years. One of them—details of which are given later in this paper—occurred in the adjoining county, another one in the same county but a few miles distant. It is probable that one calf on this very farm died of this disease within a few years, and it is evident that there are many avenues of infection through which the *B. abortus* could have been conveyed from the barn to the house, or from infected milk to the mother. This second case, therefore, confirmed me in my previous belief that this particular infection, with subsequent loss of a child, was due to the same bacillus and the same manner of infection which has cost the lives of such large numbers of live stock in various places in the immediate vicinity, and throughout the country.

Cases III and IV.—Among other interesting facts disclosed in connection with inquiries made as to the presence of infectious abortion in herds near my patient's home, I learned from one physician whose summer home is in Connecticut that he had known of a number of cases occurring in cattle in the western part of that State. Another physician told me that on the stock farm of a wealthy New Yorker at Bedford, N. Y., the herd suffered great loss of both cows and calves for several years. The herdsman's wife who had borne several normal children before the herd became infected had two and possibly more abortions at the fourth to the sixth month from unknown causes, while the epidemic in the herd was at its height. Both she and her husband became convinced that she was suffering from the same disease which affected the cattle. He gave up his position, therefore, moved to another part of the State and since that time his wife has given birth to another healthy child.

On the 7th of August, while these facts were still fresh in my mind, I devoted my lecture hour at the Post-Graduate Medical School to the subject of infectious abortion, showed the placenta and its lesions, and reported the two cases that I have just narrated; I was careful not to express an opinion as to the cause of the conditions observed. The physicians present at the lecture were then asked, in turn, to make a diagnosis from the clinical facts related. One of them, Dr. Arthur R. Whitefort, who for some years has been practising at St. Elmo, Fayette County, Illinois, stated that in his opinion these were both cases of infectious abortion which had occurred in women. In the farming community where he had practised, a number of cases of this cattle disease had occurred in former years causing the loss of many calves and of quite a number of cattle. He was, therefore, familiar with the disease as it occurs in herds, and stated that one or two of his medical colleagues had spoken to him about a few cases of abortion and stillborn children occurring in women, which they believed were due to the same germ that was destroying the cattle.

Since his return home Dr. Whitefort made further inquiries and to him I am indebted for the following additional information:

Cases V, VI and VII.—"The outbreak of infectious abortion in cattle in this vicinity occurred about thirty years ago when a herd of infected cattle were brought from Ohio by our neighbor. Many of the cows lost their calves and while the epidemic was in progress our neighbor's wife also lost her child from an abortion so similar in its clinical history and physical characteristics to the abortions occurring in the cattle, that Dr. McKinzie, the local physician, at that time about sixty years of age, made the observation that he believed that the same cause which had produced the abortion in the cattle had also caused it in his patient just mentioned. The cattle were fattened and disposed of. The lady in question died a few years or so later, shortly after another abortion had taken place.

> Dr. McKinzie has been dead for many years so that I have been unable to secure more definite information. Many years have elapsed also since other cases of infectious abortion in cattle have occurred in this vicinity as I have ascertained by inquiry among the older practitioners in our county as well as among many veterinarians.
>
> My mother tells me that another abortion took place at about the same time. A young woman living in this vicinity left home in disgrace because of a pregnancy for which the man who had charge of the cattle in the infected herd was blamed. This young woman also had a miscarriage, was very sick, never regained her health, and died in a few years."

Of course, it is impossible to demonstrate the actual cause of these three abortions. At the time they occurred the *B. abortus* had not been discovered but both cases suggest, at least, that the same infectious agent was the cause of the abortions in the cows and in the women.

A letter was written to O. E. Dyson, State Veterinarian of Illinois, asking for information concerning the cases of infectious abortion in that state but his reply stated that no investigations as to the nature of this disease had been conducted in his department.

J. P. Sedgwick, Professor of Pediatrics in the University of Minnesota, who with W. P. Larson of the same institution has made some interesting investigations of the infectious abortion reactions in children, states in his recent article:

> "We are indebted also to Dr. A. W. Robertson of Litchfield, Minnesota, for the report of two women who aborted during the time that there was an epidemic of abortion among the cattle on their farms. In these cases he was able to find no other causes by which he could explain the expulsion of the fetuses. Although these reports are not yet sufficient to form a basis for definite conclusion, they are certainly suggestive."

Dr. Robertson has been kind enough to furnish me with brief histories of his two patients.

CASES VIII AND IX.—Case I. Mrs. W. H. McG., aged thirty-four, the wife of a farmer living in this vicinity, was seen on November 12, 1913.

> Her general health was good. She had had measles, whooping cough and chicken-pox in childhood, but was otherwise well. Three children had been born to her. The oldest was 5 years of age; the youngest was born in April, 1912. All her labors had been normal and there were no lacerations.
>
> Two days before she was seen a uterine discharge of brownish blood had begun which still continued. There were no pains at

first but this evening uterine pains began and have been steadily becoming worse.

An examination showed a well-nourished, multiparous woman between four and five months pregnant. Her heart and lungs were normal. There was a free hemorrhagic discharge from the vagina and an examination showed that the cervix was sufficiently dilated to admit three fingers. The head of the fetus was presenting; labor pains were strong. A four months' fetus was soon delivered but the placenta had to be removed with the aid of a curet. Her recovery was uneventful.

My patient's husband told me that six of his eighteen cows had aborted in the two months preceding; that his wife and children all drank the milk from the herd and that his wife helped him with the milking of the cows.

On December 8, 1914, over a year later, the same patient miscarried at three and a half months. She had the same treatment and again recovered. There had been no abortions in the herd during the fall and winter of this year.

Cases X and XI.—Mrs. L. N., aged thirty-seven, of German birth, the wife of a farmer at Litchfield, was seen November 16, 1913. Her general health was good but she had given birth to eight children. All labors were instrumental. There were four living children; two of them were deformed. Four children were dead at birth.

Three days before I saw her slight uterine pains began and for the past two days there has been a bloody uterine discharge. The pains became more severe.

An examination showed a poorly nourished woman, four months pregnant. Her heart and lungs were normal. The hemorrhage from the vagina continued and a badly lacerated perineum was found to exist. The cervix was well dilated and the fetus was presenting. A four months' fetus was delivered and the placenta removed with the curet.

This woman has a flat pelvis which accounts for her difficult labors.

There are fourteen cows on the farm and five of them had abortions at about the fourth month during the previous three months. The herd milk was used in the home and most of the milking was done by the woman herself.

A year later Mrs. N. was delivered of another dead baby nearly at full term.

In his letter Dr. Robertson states:

"No blood tests were taken as unfortunately both women lived miles from town and the roads were very bad. One of these cases, as you will see, miscarried again about a year later and circumstances again prevented me from taking cultures of the blood. I expect to confine the same woman in about two weeks at full term."

Case XII.—While the preparation of this paper was in progress, Mrs. W. H., the patient referred to in Cases I and II again became pregnant. Her last menstruation began December 7, 1916, and lasted for five days. Six weeks later on the 20th of January a slight bloody vaginal discharge occurred. She remained in bed for four days. Some nausea existed and occasional chilliness with a subnormal temperature (97.6°). Vaginal examination failed to show any characteristic changes of pregnancy. On the 11th of February it appeared certain that an abortion had occurred and that the fetus had escaped although this fact had not been definitely noted by the patient. An anesthetic was accordingly given. An unusual vaginal and intrauterine discharge existed, dark brown in color and so tenacious that it resembled glue in consistency. No embryo was found during the curettage but the uterine mucosa was thickened and proliferated.

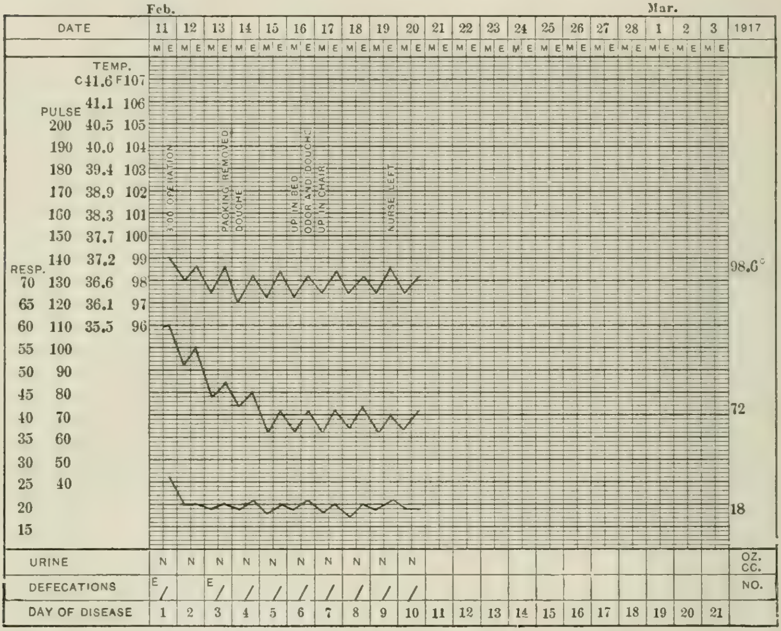

FIG. 3.—Temperature chart, puerperim, Case xii.

This uterine detritus was preserved in a sterile jar and portions were sent to Dr. Moore at Cornell, Dr. Theobald Smith at Princeton and Dr. Melvin at Washington for cultures and inoculations of guinea-pigs, to see if the presence of the *B. abortus* could be definitely determined. It was afterward learned that the usual bichloride douche was used instead of sterile water. The *B. abortus* is readily destroyed by this antiseptic and though disappointing it is not surprising that the reports received from all three of my friends on the 1st of May were uniformly negative (Fig. 3).

EPIDEMICS OF INFECTIOUS ABORTION IN CATTLE.

Epidemics of infectious abortion among cattle have been numerous. The summary of two such epidemics recently reported by Dr.

Dr. J. F. DeVine presents in a concrete form the typical conditions which he observed. Since similar epidemics have occurred in thirty-two States of the Union it is possible for the student of the subject to find numerous descriptions of such outbreaks.

"A large dairy herd of several hundred milking cows where they had more or less abortion were stricken rather suddenly with a violent outbreak of so-called "white scours." They had lost at the time I went to the farm about thirty calves. I suggested that we begin by giving the cow treatment, rather than to wait for the calf. And naturally one would ask on what did you base your opinion? If you will review some of the latest text-books they will tell you that the probable source of contagion in the calf with "white scours" is either in the uterine or in the vaginal tract, or by the broken cord coming in contact with an infected stall when delivered. They have never mentioned so far as I know, one of the most important sources of contagion, but it is my opinion, and I have so stated before, that there is still another important way in which a calf may become infected, and that is through the digestive tract, by its mouth coming in contact with the infected parts of the cow shortly after birth, when searching about for the mamma or taking into its digestive tract milk which has become infected in the udder (through the teats as they become filled, and the sphincter dilated), through contact with infected stalls or vaginal discharges.

To prove my contention in this particular case we prepared the cow and established a routine of treatment for the animals in advanced pregnancy. Every animal within a month of calving was douched daily with a milk warm solution of permanganate of potash, and all the external genitals, hindquarters and udder thoroughly scrubbed with soap and water. This was kept up to within about a week of freshening when the animal received an additional scrubbing of the entire body. A maternity stall was then prepared, by thoroughly disinfecting and liming the floor where she was housed until she freshened, the douching being continued each day until she had freshened, and from one to three times after freshening, depending on the character and amount of discharge following birth, with the result that the "scours" of the calf ceased immediately.

The offspring of any cow that had had treatment for four days before she calved did not develop "white scours," and no particular attention was paid to the calf other than to keep it clean, and the udder milked out a little and kept scrupulously clean so long as there was any discharge to infect it.

I contend that the discharges from the vaginal tract infect the stalls, slime the tail and get into the udder and poison the calf.

Another outbreak differing in its character which I had occasion to treat recently, in Northern Orange County, may also be of interest to some of you owing to the fact that not only the life of the fetus was involved, but also the dam. I will recite the history of this outbreak in order to again substantiate my belief in the virtue of sanitation.

The owner called up one morning and said that he had some six or seven cows to freshen recently; that all the calves had died, apparently of "white scours," and that they had lost three of the cows, and that the udders of two cows that had freshened within the past three days were apparently affected the same as those that died. I went to the farm at once; one of the cows was already dead, and the other one died during the day. Both of those animals had gangrenous mammitis, thus making a total of five cows and seven calves that had died within two weeks.

We began the same treatment as I have outlined, properly prepared a section of the barn for the balance of the cows to freshen in; we scrubbed the cows that were most advanced, and began douching and treating the vaginal tract, where I considered the source of contagion lay. One cow freshened the next day; the calf lived two days and then died. This cow has since made a record of 31 pounds. We saved the udder, cow and calf in the next sixteen instances of freshening."

Inasmuch as the appearances which manifest themselves in cattle suffering from infectious abortion, are unfamiliar to most physicians, I desire to refer the reader to the publications of Prof. Williams of Cornell (See Bibliography, pages 253, 254).

REPORTS OF EIGHT CASES OCCURRING IN DOGS.

The occurrence of epidemics such as these is nothing new and that the true nature of the disease has been appreciated for some years before the microörganism itself was isolated and identified, is well shown by the following extract from an article by "Ashmont," the well-known authority on dogs and their diseases. The book entitled "Kennel Diseases, their Symptoms, Nature, Causes, and Treatment," published in 1907, contains the following paragraphs under the chapter heading "Septicemia of Pregnancy."

SEPTICEMIA OF PREGNANCY.

"Confining the use of the term to proper limits, puerperal fever can only occur after labor has set in; seldom does it attack mothers before delivery is nearly if not quite completed. The disease about to be discussed so closely resembles this fever that the two have been considered identical, and therefore given the same name. But this is manifestly wrong; for while they have many features in common, there are yet some that are at variance to such a marked degree they must be accepted as distinct affections. Consequently it becomes necessary to coin a name, and the propriety of that chosen will appear anon.

Septicemia of pregnancy, like puerperal fever, is a disease produced by septic matter which has entered the blood. But while the latter occurs only after labor has commenced, the former attacks its victims during pregnancy; and they are either destroyed before they have reached the time for whelping, or the destructive work has then so far advanced that they die in labor or shortly after it has been completed.

The primary cause of this septicemia is, without doubt, some form of microbe, which enters the blood and is conveyed to one or more fetuses, which die; or it develops a virulent poison that is passed on to the uterus with the same disastrous effect therein. The fetus or fetuses destroyed decompose, and as a result there is putrid infection and blood poisoning, as in puerperal fever.

This microbe, which is evidently the primary cause of septicemia of pregnancy, obviously is not the same as that which is capable of producing puerperal fever. Where the latter occurs, infection enters by the way of the generative organs, and when they are properly protected that peculiar fever is impossible; but in the former it would appear that the germs must invade the body by the way of the nose or mouth, then make their way into the blood, from which, as stated, they, or the toxin produced by them, are conveyed to the uterus, on the contents of which their force is inflicted.

Appreciable signs that something is wrong, and which may suggest this septicemia, are not as a rule manifested until two or three days before the victims are due to whelp, although in occasional instances they have been noted a week, and even nine days, in advance of that eventful period. On the other hand, in some cases whelping has commenced before the occurrence of symptoms that excited suspicion or apprehension.

The first symptoms are generally vague and ill defined. Indeed, they vary but little from those that bitches about to whelp oftentimes exhibit, and which are induced by the first pains of labor. That is, the unfortunate ones are likely to have less spirit than usual, are not so much inclined to exert themselves, and keep closer to their kennels; and while they may eat fairly well, their appetite is none of the best.

In most cases whelping at least commences, though it may stop before the first pup is in the world, or at once if it is delivered, or persist until only one remains in the uterus—all depending upon the existing conditions—and there is a bare possibility of its going on to completion.

Where only a part of a litter has been destroyed, and the living are behind the dead, the mother is never likely to voluntarily give birth to any, although she may have labor pains for a short time.

With but one dead puppy that had presented first and been removed, labor pains would scarcely come on again with any intensity, and the delivery of the remainder of the litter would almost always require force.

With only one dead puppy in a litter, and that placed last in the uterus, the mother might unaided give birth to the living; but this is contrary to the rule, which is that they must be taken away, and the removal of the last is then always a matter of exceeding difficulty.

One or two dead puppies in each litter has been the common experience, but now and then this disease kills all, the mother as well as puppies, before the labor pains begin. And this result seems to be invariable in cases in which the attacks are well on a week or more before the victims are due to whelp.

The conclusive signs of this disease—that is, the symptoms, which are produced by it after the septicemia is advanced—are identical with those of puerperal fever. And indeed where whelping has commenced, the labor pains have ceased, and dead and putrefying puppies are retained, the case has become one of that fever.

When septicemia occurs with an intensity which proves fatal to mother and puppies several days before the period of whelping is due, the victims, as a rule, are noticeably ill only one or two days. They droop as it were, eat but little, or refuse food altogether, are disinclined to move about, and generally die quite suddenly.

Mr. Everett Millais, of London, England, had the misfortune to suffer from an epidemic of septicemia of pregnancy in his kennels, and he generously placed a record of his cases at the disposal of the writer. They in brief were as follows:

1. The victim was due to whelp Oct. 6, 1890. First signs of labor appeared Oct. 8. Pains ineffectual, and puppies removed. All dead and in an advanced stage of decomposition. Mother died on the following day.

2. Due April 4, 1891. After being dull and languid for three days,

was taken quite ill April 1. Death occurred suddenly the next day. Mother opened immediately. Five living and two dead puppies removed; the latter much decomposed; the former lived two days.

3. Due July 3, 1892. Taken ill June 30. Labor started July 1. Pains soon subsided. Mother in very critical condition. Six puppies quite speedily removed, four of which were living. The others decomposed. The following day the mother failed rapidly. Another dead and very putrid puppy removed. Death occurred that night.

4. Due Jan. 28, 1893. Natural birth at term, of eleven puppies, two of which were dead. Mother very ill for three weeks, but eventually recovered. If this was a case of septicemia it is assumed that recovery was due to the power of the mother to whelp before much septic matter had been absorbed.

5. Due July 14, 1893. Taken ill July 5, and died in convulsions on the following day. Autopsy revealed nine decomposing puppies.

6. Due Aug. 15. On that day signs of whelping appeared after the mother had been "moping" for two days. Efforts at natural delivery were feeble, and soon ceased. Six living puppies were removed, and the day following another—very putrid. Mother died Aug. 19.

7. Due Sept. 15, 1893. After being very "mopy" and "off her feed" for two days, the mother died suddenly Sept. 10. Seven putrid puppies found at the autopsy.

Scarcely ever, if ever, can mothers be saved when once this malady is on them, and the puppies must also succumb unless they are promptly removed. But removal is never easy. In fact, it is always exceedingly difficult and wearisome. And since only comparatively few veterinarians have an intimate knowledge of dogs, for the operation to be successful it must generally be performed by a physician.

Where dead puppies precede the living, the chances of removing the former in time to save the latter are seldom good; and in most cases the mothers must be sacrificed. There being no alternative, chloroform should be administered, the abdomen and uterus opened, and the puppies removed.

Only a very small proportion of the little ones so released are likely to live; yet if at once enveloped in hot blankets, gently rubbed to life, and speedily given to a foster, there are chances of their doing so.

When possible to effect delivery through the natural avenue, the uterus being freed of its contents, it should be thoroughly disinfected, as in puerperal fever.

As to constitutional treatment, at once the presence of the disease is detected, the same medicine, stimulation, and supportive treatment recommended for puerperal fever should be administered.

Recurring to disinfection, some physicians have greater confidence in the peroxide of hydrogen than in corrosive sublimate or carbolic solutions. The former can be used freely and is entitled to preference, provided the uterus is empty and its mouth so well opened that the drainage is good.

Once this disease occurs in a kennel, only with exceeding difficulty can it be made safe for bitches in whelp. Indeed, he is wise who, having had a case of it, burns the infected quarters; or, if this remedy is too expensive, purifies them as completely as possible, devotes them to general use thereafter, and provides others for whelping. If neither of these radical measures can be applied, then all that remains is to disinfect thoroughly. If the floor is of wood, it had best be removed and a new one laid down. But before this is done a large quantity of quicklime should be spread on the ground beneath and spaded in. At the same time, if the air cannot circulate freely under the floor timbers, two large holes should be made in the foundation, on opposite side, and left open for weeks and even months, if possible.

Before the floor is relaid, its timbers and the foundation walls should all be treated to a solution of corrosive sublimate, made by adding a teaspoonful of that agent to a gallon of water. This should be driven with a brush into every crack and cranny, or if there are any that cannot be reached by this means, a syringe should be used.

Allowing a day or two for this solution to thoroughly dry in, it should be followed by a lavish use of quicklime in the form of thick whitewash; which is most active when applied as soon as prepared and while still hot.

All this done, the ceilings, walls and indeed every part above should be as faithfully washed with the same corrosive sublimate solution, and this again in turn be followed by whitewash where its use is permissible.

Of course if a kennel is of expensive construction, and its walls are sheathed and painted, the owner would be reluctant to whitewash such parts, in which event he should paint, varnish, or shellac, as he may prefer, after the sublimate solution has been freely applied.

A temporary floor having been in use while this renovation has been going on, a permanent one may be laid; and thereafter, until the quarters are to be again used, every door and window in them should be kept open day and night, to admit the sunlight and air—two of the most potent disinfectants."

How closely the practical suggestions of "Ashmont" made before the *B. abortus* was discovered, correspond to the more recent suggestions of DeVine, is apparent when these two extracts are compared.

As will be seen by the opinions of my friends in the allied science of veterinary medicine and from the extensive bibliography that is appended to this article, practically nothing has been done thus far to definitely determine the identity of an organism which has caused abortion in women and to compare it with that of the *B. abortus* of Bang. It is to the literature of comparative anatomy and of veterinary medicine that we must refer if a comprehensive study of this disease is to be made. The work of Melvin, Schroeder, Cotton, Mohler and Traum of the Bureau of Animal Industry at Washington, D. C., of Theobald Smith of the Rockefeller Institute and of Moore and Williams of Cornell University, are the chief sources of information available to American students. To the opinions of these gentlemen, both oral and written, and to their cordial coöperation in this study, the writer expresses his indebtedness. The practical importance of this subject in the realm of human medicine is so great that many details must be given if this article is to be an aid to future investigators.

Definition.—"Infectious abortion of cattle is a specific infectious disease produced by the *B. abortus* of Bang and characterized by inflammatory changes of the mucous membrane of the uterus and fetal membranes, resulting as a rule in the premature expulsion of the fetus."

This definition of Mohler seems to apply with equal accuracy to the same disease in women.

Synonyms.—Contagious abortion; epizoötic abortion; enzoötic abortion; septicemia of pregnancy; slinking of calves; mammitis (garget) of cows; white scours of calves.

History.—For many years the disease has been known in England and Continental Europe and descriptions of it are mentioned in the writings of many early veterinarians. Its contagiousness was recognized as early as the eighteenth century, but it remained for Franck (1876), Lehnert (1878), and Bräuer (1880) to produce the disease in healthy pregnant cows by the introduction of exudate and material from aborting animals. The credit of the isolation of the bacillus of abortion belongs to Bang of Copenhagen, whose investigations culminated in 1897. In that year, assisted by Stribolt, he published his article describing the bacillus and showed that it was possible with pure cultures of the germ which they had isolated, to produce the disease artificially and to recover the same organism from the experimental cases. His experiments have been verified by many investigators since the publication of his paper and it is now known that the *B. abortus* of Bang is capable of producing abortion experimentally in cattle, sheep, swine, goats, mares, guinea-pigs and rabbits, both by feeding and by intravenous injections. That the injection of the organism into the uterus and even into the vagina will also cause abortion in many animals, has been demonstrated by many observers. It is impossible to believe that women should not be affected in a precisely similar way by a microörganism capable of entering the body by so many different routes, but up to the present time no experimental tests have been made to demonstrate this fact. In the very nature of the case it cannot be supposed that this fact will ever be demonstrated by actual experiment upon women. On the other hand, the writer feels that we are justified in believing that infectious abortion in women can occur and does occur in many cases that have been unrecognized and there is little doubt that in the near future laboratory tests made from the vaginal discharges or uterine contents of aborting women will demonstrate beyond question the presence of the *B. abortus* as the causative factor in such cases.

DESCRIPTION AND CHARACTERISTICS OF THE CAUSATIVE ORGANISM.

Morphology.—Bacillus abortus is a short, nonmotile, pleomorphic rod, most often of a coccoid form, 0.4 to 0.6μ wide by 1 to 2μ long; frequently its length will be less than 1μ or as long as 3μ. A smear from the exudate or gastrointestinal contents of the fetus will show the bacilli in masses composed of short coccoid or longer forms. Cultures, especially young ones, as Holth describes, show more regularity and usually are of distinct bacillary form. Involution forms of various shapes are observed in smears from older cultures. (Excellent illustrations in colored plates can be found in the 28th Annual Report of the Bureau of Annual Industry, 1911.)

Staining.—Ordinary anilin dyes stain the organism satisfactorily. In some smears the bacilli do not take the stain as readily as in others. Carbol-fuchsin followed by 1 per cent. acetic acid and also Loeffler's methylene blue bring out the pleomorphism of this organism to advantage. Unstained areas will be seen in the center, giving the bacillus the appearance of a polar or peripheral stained organism. Other bacilli will show clear or lighter areas on the sides or at the poles. The more intense staining reagents, as thionin, carbol-fuchsin, gentian, or methyl violet, will stain the organism uniformly. Dilute carbol-fuchsin, recommended by the English commission, gives very desirable results. In sections of tissues methyl green pyronin has given fairly satisfactory results. With the Gram method of staining, negative results are always obtained. In a few instances, however, the organism may retain a very slight amount of stain as compared with Gram-positive organisms used as controls on the same slide.

Cultural Characteristics.—Relative to culture media, it is found that the agar gelatin raw-serum shake of Bang and the autoclaved alkalinized agar gelatin serum of the English commission both give satisfactory results in obtaining cultures from the uterine or fetal material in a good state of preservation. Still more satisfactory is an agar gelatin serum mixture, the serum in this case being heated in Arnold's sterilizer at 60° C. for one hour each day for four consecutive days, which insures sterility. The last two methods are the most convenient and less apt to give contamination. The Nowak method of plating in the presence of a culture of *B. subtilis* is only occasionally used. For the propagation of cultures ordinary slant or stab agar, with or without glycerin and glycerin bouillon, or serum glycerin bouillon are used. Holth and the English commission also recommended a liver bouillon culture as a suitable medium for the growth of the organism.

Mohler and Traum have made extensive use of a gelatin agar shake, with or without bouillon, for the isolation of the organism. The media are composed of gelatin 40 parts and agar 50 parts, or gelatin 40 parts, bouillon 10 parts, and agar 50 parts.

Bouillon.—The inoculation of 3 per cent. glycerin bouillon causes the liquid to become slightly cloudy after several days' growth and in many instances a very fine granular film is observed on the surface. Turbidity increases, but after several weeks, growth settles and the medium becomes clear. A sediment is noticed in a few days after inoculation, especially when sown heavily. This sediment as a rule becomes stringy, but in some cultures this is not so marked. Cultures in bouillon or serum often leave a bluish line or ring on the tube at the point where the surface of the culture comes in contact with the side of the tube. In many of the tubes allowed to stand undisturbed, there would form a heavy glutinous growth on the surface. The reaction is neutral to litmus.

Slant Agar (With or Without Glycerin).—In cultures sown from subsurface colonies or from tissues, evidences of growth are not observed for at least seven days, usually ten to twelve days, at which time a watery film appears which is soon transformed into a grayish glistening growth in direct light and light bluish-green in transmitted light. The cultures soon take on a yellowish-brown appearance, beginning at the center and becoming darker with age. In thinly seeded cultures there appear small glistening, round, raised colonies showing a grayish center and a bluish-green edge, which have very little tendency to spread. They vary in size from a pin point to 4½ millimeters. The individual colonies soon show a yellowish-brown center, the entire growth becoming darker in appearance, similar to that described above for the diffused colonies. The water of condensation shows a grayish sediment and a fine granular film on the surface which is easily disturbed. Growth on this medium is often very glutinous. Cultures made from aerobic growths and especially from slant agar show a luxuriant growth in two to three days. Individual colonies on agar plates present the same appearances as those described on slant agar.

Stab Agar.—Cultures on this medium show sacculate-like growths developing along the line of inoculation within 2 or 3 days. The growth on the surface, which is more profuse, appears at first glistening grayish white, later it becomes dirty gray, and finally brownish-yellow in color.

Gelatin at room temperature does not appear to be a very good medium for the growth of this organism. On several occasions, however, *B. abortus* has been grown in this medium. The medium was not liquefied; growth was very slow.

Potato.—This culture medium has given variable results. It must be stated, however, that ofttimes the organism grows well on potato. It shows a glistening honey-like growth resembling somewhat the appearance of *B. mallei.* This similarity has been observed by most workers.

Milk.—While the organisms multiply in this medium, no perceptible change is noticed as a result of such multiplication. The reaction is neutral or slightly acid.

Fermentation Tubes.—No gas is produced in dextrose, saccharose, or lactose. The reaction after several days is either neutral or alkaline to litmus. The growth is most prominent in the neck of the tube, the bulb later becoming cloudy; the closed arm, however, in all instances remained clear, even if organisms were shaken into it.

Tenacity.—Three-day-old agar slant cultures in test-tubes washed with 0.85 per cent. salt solution and heated to 55 to 56° C. in a water bath for three-fourths of an hour were not killed; exposure to the same temperature for 1 hour, however, resulted in the death of the bacilli.

Cultures grown like the above, but poured together in a liter flask and subjected to a temperature of 55 to 56° C., were not destroyed at the end of an hour, but were killed in 1½ hours. A bouillon culture heated to 70° C. for 7½ minutes failed to grow when reinoculated. A temperature of 60° C. killed in 15-minute cultures grown on slant agar and washed with sterile salt solution.

Bang found viable organisms in a uterine exudate kept in an ice chest for 7 months. Nowak reports that he obtained subcultures from a year-old culture.

Holth obtained a culture from material from fetuses kept at 2 to 4° C. for eight months, and also from a series of pure cultures kept at room temperature for 9 months, but no growth could be obtained at the end of 1 year.

The observations of Mohler and Traum, who have been thus extensively quoted, found this quality of the organism a variable one. Cultures on agar slants with paraffined plugs, kept at room temperature, have remained alive for 6 months. Cultures kept under the same condition for 9 months were no longer viable. The same observations were obtained with cultures stored in the ice chest for a similar length of time. Bouillon cultures kept at room temperature were still viable after 8 months.

Probably the most important and comprehensive facts which have been demonstrated in connection with this disease are the discovery, first, that the abortion bacillus is eliminated with the milk of infected cows, and, secondly, that this bacillus is found in the tonsils of children, presumably as the result of drinking such infected milk. The frequency of the presence of *B. abortus* in a food product like milk and the ability of the organisms to produce lesions in guinea-pigs, pregnant cows, and other animals lead at once to the thought that *B. abortus* may prove pathogenic for human beings.

The investigations of Mohler and Traum were not productive of definite results along these lines of investigation, but Sedgwick and Larson of the University of Minnesota in two excellent papers have called attention to the fact that the blood serums of children consuming milk from cattle infected with infectious abortion ofttimes contains antibodies against *B. abortus*. In a series of 425 children whose blood was tested to either or both agglutination and complement-fixation reactions, 17 per cent. showed a positive reaction. It was also observed that children known to be supplied with milk from a perfectly clean herd, that is, one which had never been affected with infectious abortion, did not give this reaction, while those fed on milk purchased in the market gave a high percentage of positive reaction. Since Bang has shown that animals may become infected by the intestinal tract just as readily and with almost the same degree of certainty as when the organisms are injected subcutaneously or intravenously, it will readily be seen how anyone who consumes milk is amply exposed to infection.

It is the general belief of the medical profession that syphilis is the most common cause of abortion in women but the investigations of Larson with the blood of aborting women showed that the complement-fixation reaction when the *B. abortus* was used as an antigen was even more common than the Wassermann reaction. If future experiments substantiate these observations our views concerning abortion in women must be materially modified so far as the relative importance of syphilis is concerned.

The summary of Sedgwick and Larson in their latest publication is as follows:

"1. This further study confirms our earlier report of the finding of a deviation of complement in children with the use of the *B. abortus* as antigen.

2. New-born children who have been fed at the breast *only*, do not show the reaction. One baby, three weeks old, after having been off the breast two weeks and on a food containing cow's milk, gave a positive reaction.

3. The finding of positive reactions in children with large spleens is suggestive.

4. The blood of children giving positive Wassermann reactions may show no deviation of complement when the *B. abortus* is used as antigen.

5. Children with many of the common diseases of children, including rickets, gave negative reactions. Much further study is, however, necessary with such conditions.

6. For the practising physician, the importance of breast feeding and the desirability of the heating of all cow's milk administered is emphasized."

"*Susceptibility.*—Cows of all ages are more or less susceptible to the disease. Animals in their first or second pregnancies are more apt to abort if exposed than at any other time. Cows that have aborted once may abort a second time; abortion in the same cow more than twice is an unusual occurrence. Heifers from aborting mothers may be less susceptible than those born to noninfected dams; in fact, in one herd under observation such animals have shown a pronounced resistance to infection. Cows and heifers reared in a noninfected environment very often abort shortly after being brought to infected premises."

It would appear from the cases cited that the infection is more permanent in women than in cattle. In each case reported by Dr. Whitefort and by Dr. Robertson at least two abortions took place, and in my own patient abortion has occurred in three successive pregnancies.

Agents of Dissemination.—Even before the discovery of the specific organism various observers had recognized the infective character of the afterbirth, fetus, and vaginal discharges from the aborting animals. Franck and Bräuer were able to produce abortion experimentally with afterbirth and vaginal discharge from aborting animals. The fact that the specific agent has now been isolated in a majority of cases from the gastrointestinal tract, and at times from the liver and general circulation of the aborted fetus, places the product of conception prominently in this list. Milk has recently been added to the number of agencies by which the virus is eliminated from the body, as has already been referred to above. Thus the stall, litter, bedding, feed, water, pastures, stockyards, transportation cars and boats, attendants, their clothing, and various other objects can very readily become contaminated with one or more of the above-mentioned sources of infection, thereby acting as disseminators of the disease to other animals. The manure, if not composted properly and the outermost layer disinfected, may spread the disease to distant points. McFadyean and Stockman mention the possibility of foxes aborting as a result of infection with *B. abortus* and acting as carriers of the infection. The same holds true in cases of other animals, and especially with sheep and goats, since these animals have been claimed to abort not only as a result of experimental inoculation but also by *pasturing* or feeding on infected premises.

The clinical history of the various women reported in this article confirms the writer in the belief that the same agents of dissemination which cause infection in various animals may also cause a similar infection in women, particularly in women living upon farms where the exclusion of infected articles from the house is practically impossible and where the possible infection of the genital organs of both men and women in the ordinary habits of farm life can easily occur. The undoubted infectiousness of milk is an important factor to be considered. Several of the women mentioned could easily have become infected by their contact with cattle while milking them.

Pathogenesis.—"Veterinarians are agreed that no matter what the mode of natural infection may be, it is obvious that the bacillus of abortion shows a predilection for the mucous membrane of the uterus. The multiplication and activities of this organism result in the injection and catarrh of the uterine mucous membrane and the formation of the characteristic yellowish to dark brown tenacious exudate on the surface, and, in some instances an infiltration of the submucosa. The intervention of the exudate, or the necrotic changes of the cotyledons sometimes found, interfere with the osmotic changes between the fetal and maternal membranes, thus producing the death and expulsion of the fetus. The death of the fetus may also be occasioned by the entrance of the organism into the fetal circulation through the destroyed placental capillaries. The accumulation of a large amount of exudate at the internal os may act as an irritant or as a solvent and cause the opening of the cervix and expulsion of the fetus. Death of the fetus does not always cause its discharge, but it may be retained within the uterus, which results in its maceration or mummification."

The above quotation from the work of Mohler and Traum, it will be seen, corresponds exactly and in detail with the clinical symptoms of the three cases that have come under my personal observation. In animals and in man the one constant and characteristic pathologic change present in practically all cases of infectious abortion is a yellowish and dark brown exudate found between the uterine mucous membrane and the chorion, varying in consistency from a mucopurulent to a tenacious gluey substance.

In Cases II and III which I have reported, the uterine discharge resembled thin brown glue. This in itself may ultimately be found to characterize this particular disease in the course of human pregnancy.

The umbilical cord in cattle in many instances shows a serohemorrhagic infiltration. In Case II this was especially noted as the cord was more than 2 inches in diameter. Just what constitutes the chief changes in the pathologic anatomy in men does not appear to have been thus far observed. The mothers have all recovered in the cases reported. In animals, however, artificial inoculation of guinea-pigs with the *B. abortus* caused lesions in the liver, tonsils, lungs, spleen and kidneys and so closely resembled those of tuberculosis that for some time the two diseases were not differentiated. Excellent photographs of the lesions found are published in the "Twenty-Eighth Annual Report of the Bureau of Animal Industry." In the same report in connection with the article by Mohler and Traum are colored illustrations of the *B. abortus* and of various forms of plate and tube cultures.

Nicoll and Pratt tried in a number of cases to produce the lesions of *B. abortus* in guinea-pigs by the inoculation of adenoids and tonsils. The fact that they were successful in only one instance is discouraging but not conclusive since some variation in the technic not yet discovered may ultimately make inoculation experiments positive in character.

Symptoms.—The symptoms in cattle are quite characteristic and are well shown in the accompanying illustrations. It is quite evident, however, that such observations could not be made with women although a profuse vaginal discharge of a brown color and viscid character with intense inflammation of the vaginal mucous membrane and swollen vulvar lips may well be regarded as suggestive.

The actual occurrence of abortion seems to depend upon the amount and activity of the infective agent present. In my own cases, the first child was dead and macerated at term; the second child was born two weeks before term, was well developed, but lived but a few minutes; the third pregnancy resulted in spontaneous abortion at the second month. Cows may abort a second time but a third abortion in the same cow is rare. A certain amount of progressive immunity appears to develop and it is not improbable that this fact may be observed later in infected women.

Diagnosis.—With animals accurate diagnosis in advance even in infected herds, has not yet been secured. The constant presence of the abortion exudate may be of aid in making the diagnosis. More recently bacteriologic, serologic and allergic tests have been tried more or less successfully. Full details of these tests will be found in the article by Mohler and Traum. The agglutination test, the complement-fixation test and the hemolytic test have all been tried but conclusions at the present time are unstable.

Prevention and Treatment.—It is evident that this disease occurs but rarely in women when compared with many other better known conditions, particularly syphilis. On the other hand, the investigations of Sedgwick and Larsen have shown that in those parts of the country where infectious abortion is of common occurrence in herds, the fact that 17 per cent. of children who consumed milk from infected herds gave positive reaction is suggestive and would indicate that this possible source of infection is more prevalent than is generally appreciated. Williams has shown that sterilizing the milk before feeding it to calves is an effective means of safe guarding these animals. This is another argument for the sterilization of milk used for domestic purposes.

For the actual treatment of the disease in infected women little that is positive can be stated at the present time. By analogy it would seem that a properly prepared bacterin can be given to women who from necessity or circumstance come in contact with milk from infected herds. The future may develop some more effective means of treatment for both animals and women.

It is, of course, a proper attitude for the trained bacteriologist to assume that no case is proven until cultural experiments have been able to recover the infectious organism. On the other hand, in spite of numerous investigations by skilled observers, even the cause of smallpox, scarlet fever and measles is not yet definitely known. Professor Orth of Göttingen once said: "With tuberculosis it is not possible in every instance to prove with certainty the presence of the bacilli, but we all know a ground hog's hole even if we do not find the ground hog."

It is to be hoped, at any rate, that in the large number of abortions and various periods of pregnancy which occur in women, there are certain cases in which traumata and syphilis can both be excluded and which by their clinical history, character of vaginal discharge and pathologic changes in both fetus and placenta will be sufficiently characteristic to warrent additional clinical reports which will substantiate the theory which the writer has advanced and which he believes to be true. The placentæ and the organs of still-born children in such cases should be studied by means of cultures and by animal inoculations. Then, sooner or later, some laboratory clinician will appear who will supply the missing link which is now lacking to make the chain of evidence complete.

59 West Fifty-fourth Street.

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"THE ELIZABETH STEEL MAGEE HOSPITAL OF PITTSBURGH."*

A PRESENTATION OF ITS ACTIVITIES AS A MODERN HOSPITAL FOR WOMEN.

BY

CHARLES EDWARD ZIEGLER, M. D.,

Pittsburgh, Pennsylvania.

THE late Christopher Lyman Magee of Pittsburgh left practically his entire estate of three and a half millions of dollars for the building, equipment and endowment of a hospital to be erected to the memory of his mother, Elizabeth Steel Magee. His homestead, consisting of a large frame dwelling surrounded by ten acres of beautiful landscape gardens and located in the residence section of the city, was given as the site for the new hospital buildings.

The nature of the hospital to be erected was not definitely specified by Mr. Magee in his will, but presumably was to be a general hospital. Investigation, however, of the hospital conditions in Pittsburgh at the time the provisions of the will became operative, revealed the fact that fully 30 per cent. of the beds in the general hospitals of the city were unoccupied so that it was plain to the trustees that there existed no need for additional general hospital accommodations. It so happened that a clause in the will directed that "there be admitted to the hospital all females applying for admission thereto for lying-in purposes," who were to be received without any questions being asked as to their past lives and identity. So much of the will was thus perfectly plain, namely that the hospital was to be, in part at least, a maternity hospital. On the basis of this fact and remembering also that the city was greatly in need of such an institution, the trustees very wisely decided to build a hospital exclusively for women.

It has always been a matter of conjecture as to why Mr. Magee specifically provided for lying-in patients and especially for the unmarried mother. The answer is doubtless to be found first of all in the fact that Mr. and Mrs. Magee were childless. Mr. Magee in particular was greatly disappointed and felt the loss keenly. His heart was very tender toward little children and he was frequently moved to assist in providing shelter and medical attendance for dependent mothers at the time of childbirth. He was the political boss of Pittsburgh and as a member of the state legislature was largely responsible for securing state appropriation for the hospitals of his city. He was thus many times called upon to secure admission to the hospitals of cases of labor and especially of illegitimately pregnant girls. Most of the hospitals at the time were not prepared to care for them and ordinarily refused to admit unmarried women. Mr. Magee in consequence knew better than any one else the crying need for such an institution in Pittsburgh.

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* Read before a meeting of the Society of the Alumni of the Sloane Hospital for Women, Jan. 26, 1917.

Having decided to build a maternity hospital, the next step for the trustees was to determine how the hospital was to be organized and conducted. Tremendous local pressure was brought to bear upon the several trustees by the physicians of the city to establish an open policy as regards the private rooms and to create a staff of a number of physicians to look after the ward patients. Great credit is due the trustees for the rare good business sense which they exhibited in deciding this matter. The one and only purpose which they had in mind was to do the best thing for the future patients of the hospital and for the community. They therefore sought disinterested advice outside of the city. Letters were accordingly sent to a number of the leading obstetricians of the country holding the chairs of obstetrics in certain medical schools. Prompt replies were received from all of them and were practically a unit in the following recommendations: 1st, that there should be but one head to the hospital in the person of a medical director; 2nd, that the hospital should care for both obstetric and gynecological cases, and 3rd, that the hospital should be a teaching hospital and should operate in affiliation with the Medical School of the University of Pittsburgh. A committee of the trustees later visited a number of the gentlemen from whom letters had been received with the result that the decision was soon reached to establish the hospital on the basis of the recommendations received.

The hospital cares for obstetric and gynecologic patients only and is therefore strictly a woman's hospital. It has a bed capacity of 140 adults and eighty-five babies. There are twenty-one private rooms, accommodations for thirty-seven antepartum patients in a separate department and eighty-two postpartum and gynecologic patients in the wards. Ample provision has been made for future extensions. By raising the roof and building up the walls, two stories may be added to each of three wings and one story to each of the remaining two wings, providing for 125 additional adult patients.

It is said that the German poet Heine during his first visit to the most famous church in Paris, said to his friend as he gazed upon the magnificent structure: "Here we see the difference between men's opinions and their convictions. Opinions never build such a temple as this." These words apply with equal force in every field of endeavor. Every great institution and every great cause has had its origin in the profound conviction of some one individual, who in spite of every obstacle and in the face of great opposition fought on and on for the recognition of his idea and the accomplishment of his purpose. The history of medicine in particular is a recital of this conflict for the mastery between truth and error. Reforms have ever come slowly. Even in this day, the fact that a thing is new is in itself almost, if not quite, sufficient to kill it. The greater the departure from the beaten paths—the more radical the changes proposed in the established order of things—the greater the opposition and the slower the progress. We are just now on the eve of a great reformation in the teaching of medicine. And when it comes —I reluctantly assert it—it will be found that the Magee Hospital has stood from its very beginnings, with the pioneers of the new order of things.

The Magee Hospital therefore represents a very positive ideal and justifies its existence on the basis of a very definite purpose which it hopes to accomplish. It is of this that I especially desire to speak.

May I preface my remarks by quoting somewhat at length from the Dedication Address of Professor W. W. Chipman of Montreal, presented at the opening of the new Magee Hospital. He says: "The richness of this material inheritance is well exemplified in the institution which we open to-day. A hospital wonderfully equipped, with all known facilities for the care of the sick, for careful investigation and teaching, has fallen to the lot of few professors. And when we add to this an adequate staff of paid assistants and a generous recognition as regards himself that the laborer is worthy of his hire, we seem to have arrived at an academic millenium. The refreshing part of the whole business is that the conditions are untrammelled and that while clinical facilities are abundant, there is ample equipment for investigation and research. There are two special features of this material inheritance which are deserving of fuller remark. The one, the fusion into one department of obstetrics and gynecology —the so-called "Frauenklinik," and the other the establishment of clinical teaching on the full-time or university basis. In America both these conditions are modern; and with them both there can be no serious contention.

(1) "In respect to the Frauenklinik, there can be, I think, but one opinion, for it makes for unity and coördination. Obstetrics and gynecology are not only sister subjects, but they are twin sisters; for together they express the sum total of woman's sexual life. The one—Obstetrics—represents the discharge of normal function, while the other—Gynecology—embraces the vicissitudes to which unfortunately the normal function is liable. Accordingly the combined clinic treats of this genital system both in health and disease, and a knowledge of the two is interdependent. A modern obstetrician must be a gynecologist, whereas a knowledge of obstetrics makes for good and conservative pelvic surgery. The argument that one cannot practice both obstetrics and gynecology, because there are only twenty-four hours in the day, no longer obtains in this full-time system. Placed on this university basis, the professor of obstetrics and gynecology may practice both, and find ample time for teaching and research. And his teaching in these two subjects, in my opinion, gains enormously, for it is not only economical of time but in an admirable and natural way, it correlates the work.

(2) "By the adoption of the full-time system we secure in the widest and best sense, professional teaching. The teacher will teach not only in the class room and at the bedside, but in the laboratory and museum; his whole day and his entire energies will be devoted to his work. No longer will he be driven and distraught by the captious demands of private practice; no longer be compelled, in the words of John Hunter, 'to go and earn the damned guinea.' It is true he may engage to some extent in practice, and this I take it, is a great salvation. For in this way he will not become entirely divorced from the work-a-day side of things. Humanity inside a hospital is one thing, and is comparatively easily managed; outside a hospital it is entirely another. I believe a necessary preliminary in the training of a medical professor should include always some years in the actual practice of medicine. By reason of this actual dealing with men—and very especially with women—he comes to know them on their human side—a knowledge which will forever savor his teaching. A knowledge of human nature is an absolute essential to the successful practice of our profession, and it is the practice of medicine we are always endeavoring to teach."

Abraham Flexner in his "Medical Education in Europe" expresses exactly the point of view which we have held for years in Pittsburgh and which now finds its expression in the new Magee Hospital. He says that separation of obstetrics and gynecology into two specialties tends to make a midwife of the obstetrician and an abdominal surgeon of the gynecologist, to the neglect of the fundamental pathologic and physiologic problems in both cases. Consolidation avoids the necessity of drawing arbitrary lines by way of making two specialties where Nature has made but one; for obstetrics and gynecology have a single physiologic and anatomic point of departure, namely, the child-bearing function.

It is as a teaching and research institution for obstetrics and gynecology that the Magee Hospital will justify its existence and do the great work for which it was established. Upon this subject I cannot do better than to repeat here in substance what I have said elsewhere and on other occasions: I wish to insist, first of all, that a medical school should be primarily an educational institution and a medical institution only secondarily, and should exist for the public good as do all other educational institutions. The teacher of medicine should be an educator in the broadest and best sense of the term and should stand in the closest relationship to all the complex and difficult problems of medical education and medical service. His chief and only business should be that of teacher and investigator and he should not under any circumstances use his professorial appointment to gain additional income from private practice. This does not mean that the teacher should not practice medicine. On the contrary, for the teacher of clinical medicine extensive experience in practice is an indispensable qualification. It simply means that he should be compensated by salary on the basis of a teacher and educator just as are teachers and educators elsewhere. All his contact with patients should be regarded as but a part of his service in the capacity for which he is professedly employed, and as a part of the scheme for ever increasing improvement in his professional equipment and service.

In this connection there arises the question as to whether or not private patients should be cared for in a teaching hospital. It seems to me that there can be no serious objection to this. It is on the contrary of distinct advantage to both the hospital and the teaching staff. The presence of private patients raises the tone of the institution, secures better understanding and coöperation on the part of the public in behalf of the hospital and its work, provides additional clinical and teaching material without expense and usually at a profit to the hospital; and in case the hospital gets the fees for professional services, there is provided a source of very considerable income. The presence of private patients moreover has a distinct influence upon the morale of the staff and adds greatly to the enjoyment and interest of the workers. All fees received from private patients for professional services should go into the hospital treasury and be credited to the earnings of the institution.

What I have said refers to teaching hospitals only, in affiliation with or an organic part of a university medical school. Just so soon as a hospital becomes a part of an educational unit or system it enters the public service and there must be divorced from it all idea of commercialism and of individual or personal profit or gain. Educational institutions may not be regarded as commercial enterprises and there can be therefore no good reason why a medical school, or any part of it, should be an exception. There can likewise be no good reason why a university professor in the school of medicine should use, for his financial enrichment, the hospital appointment which has been assigned to him as a part of his professorial equipment.

It may be argued that when the knowledge and skill of a medical teacher brings large financial returns from private patients, he is entitled to the fruits of his labors. The answer to this contention is that it is not possible for him to build up such a large income on his own efforts without destroying his usefulness as a teacher and investigator. In addition he is using the teaching staff of the university including the laboratory workers, to accomplish his purpose and without their having any part in the profits of the business. If private patients are admitted they must be regarded primarily as belonging to the hospital and not as the private property of the medical director or other member of his staff. The patients themselves must understand this and must understand further that the professional services which they will receive will be provided by the staff as a whole—a group unit so to speak—with the medical head of the hospital as director of the group. This policy presupposes the existence of a number of trained men on the staff capable of meeting successfully any accident or emergency which may arise—a necessity in any event in the interest of all the patients in the hospital—ward as well as private. Just so soon as private patients understand that they cannot and will not receive any better or different professional care than the ward patients receive, which is the best the hospital affords, there will be no trouble in satisfying them.

Such a working plan as above outlined is necessary to prevent conflicts between the teaching and research on one hand and practice on the other. It leaves the medical director or other designated member of his staff free to do work which is expected of him or has been assigned to him for an appointed time; and in the case of private patients also it leaves the medical director free at all times to go where he is most needed to direct or take charge of difficult cases.

The medical head of a teaching hospital should keep ever before him the fact that his chief business is to direct, to teach and to inspire the members of his staff and that the hospital exists for their benefit no less than for his. He should not use his position and opportunities to build for himself a reputation at the expense of his staff any more than he would use them for financial advantage. The head of a teaching hospital who fails to turn out, after years of opportunity, men worthy to succeed him and capable of doing even better work than he has done, has failed. I take it that the chief function of a teaching hospital is to train teachers and investigators and that the giving of undergraduate instruction is secondary and incidental. I cannot agree with the dictum that teachers are born and not made. The great trouble is that no serious attempt has ever been made, deliberately and systematically, to do it. They must be properly taught and must be given abundant opportunity to practice teaching under men who are themselves good teachers. The major part of undergraduate teaching should be given by assistants in training for this very purpose.

From what has been said of the functions of a teaching hospital, you will be able to form a very good idea of the policy and purpose of the Magee Hospital. It is a teaching hospital operating in affiliation with the Medical School and is a part of the department of obstetrics. The professor of obstetrics in the medical school is medical director of the hospital, lives with his family in a residence provided for him on the hospital grounds and is paid a salary sufficiently large to make him independent of all other work. He is therefore a full-time university professor giving his entire time to teaching, research and the care of hospital patients. All fees received from private patients go into the hospital treasury and are credited to hospital earnings. All the members of the hospital staff are likewise members of the teaching staff of the department of obstetrics in the medical school. They are all of them on salaries, are likewise full-time teachers and reside in the hospital.

RÖNTGENTHERAPY SUCCESSFUL IN UTERINE FIBROID WITHOUT AFFECTING THE OVARIES.*

REPORT OF A CASE, AND SPECIAL TECHNIC.

BY

GEO. E. PFAHLER, M. D., AND JOHN A. McGLINN, M. D.

Philadelphia, Pa.

THE value of the Röntgen rays in the treatment of uterine fibroids has been sufficiently demonstrated by the large number of patients successfully treated and reported by competent authors. The effect of the Röntgen rays upon uterine fibroids has been assumed in the past to be due entirely, or almost entirely, to the action of the rays upon the ovaries. This theory was probably devloped upon the information obtained experimentally upon animals that the Röntgen rays are capable of reducing the activity of the ovaries or completely obliterating their action, and secondarily upon the observed fact that in some cases uterine fibroids disappeared after the menopause, and upon the third observation that the fibroid at times disappeared after removal of the ovaries. It was probably these observations that originally lead to the employment of Röntgen rays in the treatment of uterine fibroids, for if the removal of the ovaries will produce a certain effect, the suppression of their activities by the Röntgen rays should produce the same effect.

Practically all the authorities have depended upon the reduction of ovarian activity for their effect on uterine fibroids. In a paper read by invitation before the American Gynecological Society, 1915(1) I (G. E. P.) expressed the opinion that the action of the rays is upon the tumors as well as upon the ovaries. I also made the statement that I believed we would find it possible to cause the disappearance of tumors without actually destroying the action of the ovaries.

Fränkel(2) referring to the treatment of young women, has seen repeatedly amenorrhea produced for a few months; then the patient became pregnant, and gave birth to a perfectly healthy child.

In a paper read by invitation before this society in February, 1913 by one of us (Pfahler)(3), the case of a woman of thirty-four was reported in whom a fibroid tumor had been completely dissipated by Röntgen treatment, and after missing two menstrual periods normal menstruation returned and had continued four years when last heard from. In this case no pregnancy had developed, but the continuation of normal menstruation led me to believe that such was a possibility.

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* Read before the Obstetrical Society of Philadelphia, April 5, 1917.

Stern, in a paper published in 1915(4), reports two cases of pregnancy in young women who had been treated for uterine fibroid over a period of time by Röntgentherapy. The first patient was a young woman of thirty-two who had been married ten years, had one child eight years old, and was suffering from multiple fibroid with excessive hemorrhage. Between February and August of 1912 the patient received thirty-four fractional x-ray treatments. At this time Dr. Brettauer found the patient so much improved that he advised discontinuing treatments. The patient menstruated normally up to November when menstruation ceased. On July 26, 1913, a baby boy weighing 6¾ pounds was born. Both the pregnancy and labor were normal.

The second case was a young woman who had a uterine fibroid of considerable size with irregular and profuse menstruation. She had sufficient x-ray treatment to diminish the size of the fibroid and to produce a temporary amenorrhea. She afterward became pregnant and went through a normal labor and was delivered of a normal child.

At the Freiburg Clinic, treatment is always continued until a complete amenorrhea is produced. One or two series of treatments is then given, after this, so as to make the amenorrhea permanent. This thorough treatment will undoubtedly produce a more complete elimination of the fibroid, but in young women in whom pregnancy is desirable or normal menstrual period important, such a course of thorough treatment may sometimes be objectionable.

In the past, in all instances, the aim has been to produce an amenorrhea. When the amenorrhea was not produced, or when it was not permanent, I believe it was accidental excepting as in the first case reported by Dr. Stern. In all instances, however, it seems that the aim had been toward the treatment of the ovaries for their influence on uterine fibroid. *Therefore, we believe that the case which we are about to report is the first instance in which a definite attempt has been made to disperse a uterine fibroid without influencing the ovaries, and with the definite object in mind of preserving the fecundity of the patient.*

Clinical Report: (JOHN A. McGLINN).—Mrs. E. C., primipara, age twenty-four. Patient first seen May 18, 1915, in consultation with Dr. George Mintzer. She was then five months' pregnant and complained of excruciating pain in the sacral region and aggravated nausea and vomiting. Dr. Mintzer diagnosed the case as one of pelvic tumor complicating pregnancy. On examination, I found a large soft boggy mass filling the hollow of the sacrum, the cervix displaced high in the pelvis, anterior and the uterus enlarged to correspond with five months' pregnancy. The mass posteriorly seemed to be part of the uterus and there was a sharp angulation on the posterior uterine wall between the mass and the cervix. Several days previously I had seen and operated upon a case of incarcerated retrodisplaced pregnant uterus which presented the same symptoms and physical signs and which had been mistaken for a pelvic tumor. I, therefore leaned strongly toward the diagnosis of incarceration in this case. Attempts at reposition of the uterus failed. It was then advised that reposition should be tried under anesthesia and if this failed reposition should be accomplished by abdominal section.

She was admitted to St. Anges Hospital and on the following day, May 19, 1915, manual reposition under ether failing, the abdomen was opened. Instead of an incarcerated fundus, we found a myoma, the size of a large orange, growing from the posterior wall of the uterus completely filling the hollow of the sacrum. The tumor was soft and apparently not encapsulated and it was impossible to remove the tumor except by hysterectomy. After consulting with her husband and parents, it was decided not to interfere with pregnancy and to deliver her, if she went to term by Cesarean section if the tumor interferred with normal delivery. Fortunately, she aborted, one week after operation, an anacephalic monster. She made an uninterrupted recovery from the operation and miscarriage and left the hospital in three weeks.

She was next seen September 22, 1915. The uterus was anterior and well involuted. The tumor on the posterior wall was only slightly smaller than when last seen. A small fibroid nodule the size of a walnut was also found at the left uterine cornua. This growth was not noticed previously.

The patient was very anxious for children and refused hysterectomy. I then took up the question of *x*-ray treatment with Dr. Geo. E. Pfahler. Dr. Pfahler was averse to treating the patient on account of her demands that pregnancy should not be interferred with by any treatment we should adopt. Finally after a thorough understanding with the patient, it was decided to attempt to irradiate the tumor and to protect the ovaries as far as possible. Accordingly, I mapped out the exact situation of the tumor for Dr. Pfahler who provised a special technic for the treatments. No attempt was made to treat the small growth of the fundus of the uterus and the treatments had no effect upon it.

Patient next seen December 30, 1915. Has had three *x*-ray treatments. Backache better; menses regular, last four days. Mass on posterior wall much reduced in size. No longer fills the culdesac: feels size of small egg.

January 27, 1916.—*X*-ray treatment January 26, 1916. No change in size of mass since last examination. Normal menstrual period two weeks ago.

February 16, 1916.—Menstruated normally from February 9 to 14. Tumor seems slightly smaller.

March 24, 1916.—Last normal period February 9 to 14. Three weeks later had slight bloody discharge which lasted two days, had not seen anything since. The uterus is larger than at the last examination, the bulk of enlargement being due to the tumor at the left cornua. The question of possible pregnancy was considered though the patient had been warned to avoid pregnancy until we gave our consent. She admitted having had intercourse but stated that withdrawal was practised.

April 27, 1916.—Normal menses on April 7. Tumor smaller.

June 28, 1916.—Mass on posterior wall of uterus entirely gone. Tumor still present at left cornua. Advised to resume normal sexual life.

October 25, 1916.—Last menstrual period September 8 to 12. No definite signs of pregnancy present. No change in the nodule at the left cornua of uterus. No evidence of original mass in posterior wall of uterus.

March 12, 1917.—Last menstrual period September 8 to 14. Felt life about the middle of January. Uterus enlarged to correspond with the sixth month of pregnancy. Diagnosis: Pregnancy at sixth month. Pelvis entirely free. No evidence of original growth on posterior wall of uterus. Nodule at left cornua still present and slightly enlarged. Date of expected delivery June 15, 1917.

Technic.—Because of the fact that uterine fibroids have been successfully treated by means of the Röntgen rays after the menopause, and because of the favorable effect of deep Röntgentherapy on all types of tumors, we reasoned that the fibroids in the uterus should be favorably influenced without directing the rays through the ovaries. Fortunately this patient was a favorable case to test this theory. The fibroid was in the median line and occupied the posterior wall of the uterus. Granting that the ovaries were in normal position the location of this tumor we reasoned would permit the direction of the rays to the fibroid without passing them through the ovaries. Acting upon this theory, treatment was given entirely through the median line, the ovarian region being protected. On October 14, 1915 three full doses were sent through three different portals of entry in the median line anteriorly, and two similar full doses were given in the median line posteriorly, and so directed that they would reach the fibroid in the uterus without reaching the ovaries.

One month after the first course of treatment was given the patient reported that her last menstrual period was the first painless one that she had ever had, and the first in which she did not have to go to bed. She also reported that she could then lie on her side without discomfort. The second course of treatment was given November 10, 1915, three doses anteriorly in the median line, and four doses posteriorly in the median line and through the sciatic notch. The third course of treatment was similarly given on December 8. On January 5, a fourth course of treatment was given, three doses anteriorly and two doses posteriorly. Penetrating rays were used corresponding to No. 9 on the Benoist scale, filtered through 4 mm. of glass and 2 mm. of aluminum, with 40 milliampere minutes at a distance of 8 inches and confining the rays strictly to the area treated.*

Remarks.—The observations in each case, together with the observation previously made, that uterine fibroids occurring after the menopause can be made to disappear under the influence of the Röntgen rays, prove undoubtedly that the effect of the rays is in great part upon the fibroid itself. It does not, however, prove (nor do we believe) that the effect on the ovaries has no influence on the disappearance of fibroids. The repeated congestion of the fibroid produced by ovarian excitement undoubtedly has some influence in keeping up the growth of the fibroid, and consequently will, in a sense, counteract the effect of the rays when directed to the fibroid only. For this reason, when there is no good cause for the preservation of the ovarian function, it will be more satisfactory, more effective and more prompt in results if the ovaries are treated as well as the uterus. Therefore, it can be assumed that more treatment will be required to bring about success in the treatment of a uterine fibroid with the object of preserving the function of the ovaries than will be required when the ovaries are treated as well. The results in this case, however, would not justify such a conclusion, for we only gave four courses of treatment, and by the same technic, in the average case of uterine fibroid at least five courses of treatment are necessary to bring about satisfactory results.

This case illustrates the importance which we have both previously learned of conjoint observation and treatment by both the gynecologist and Röntgenologist. By such conjoint action, the mistakes in diagnosis and treatment will be reduced to a minimum. Complications can be dealt with intelligently; and the most satisfactory end results obtained.

In the above case the scar of the previous operation was not in any wise protected nor treated differently from the surrounding tissues. There was no reaction in the scar, and no damage to either the scar or the skin. With proper technic, thorough filtration and the use of good penetrating rays, properly measured, there should be no damage to the skin as a result of this treatment, and if any complications should later arise demanding surgical interference there is nothing to interfere with a successful operation. It is fortunate that the monstrosity of which this patient was delivered occurred before the Röntgen rays were applied or the treatment would have been blamed for it as it usually is for any accidental or coincidental complications which may develop during treatment.

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* Since the above communication was read, the patient has been delivered of a normal child at term. The labor, which was entirely normal, lasted four hours and was without any complications.

CONCLUSIONS.

1. We believe this to be the first case in which a gynecologist and Röntgenologist have definitely planned, and successfully carried out, Röntgen treatment for the reduction or dissipation of a fibroid of the uterus, with the protection of the ovaries, and proof of their success by subsequent pregnancy.

2. The results in this case would strongly suggest that, in dealing with a patient otherwise healthy in the child-bearing period, in which the uterus is involved by fibroid, the gynecologist is not justified in the removal of the uterus without first making the attempt at treatment with the Röntgen rays by directing the rays against the fibroid and shielding the ovaries.

3. The success of the treatment in a case like this demands, first, a very careful and thorough investigation by the gynecologist as to size and position of the fibroid. Second, he should report, so far as possible upon the condition and position of the ovaries, and third, the Röntgenologist should be most careful in his technic as to the direction of rays and as to the protection of the skin of the patient, and in shielding the ovarian region, for, if operation is needed later, or if the Röntgentherapy is not successful in removing the fibroid, the skin must not become damaged.

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INVERSION OF UTERUS. OPERATION BY SPINELLI METHOD. RECOVERY OF THE PATIENT.*

BY

GEORGE ERETY SHOEMAKER, M. D., F. A. C. S.

Gynecologist, Presbyterian Hospital, Consulting Surgeon, Woman's Hospital, Philadelphia. Pa.

The accident of uterine inversion is an unusual one, so that the experience of any one physician is likely to include a very small number of cases, probably one in his own practice and two or three seen in consultation. Each case is therefore worthy of record in order that a general agreement may be reached as to methods and results of treatment. In the acute stage, notwithstanding the alarming hemorrhage and shock, the replacement of the fundus by slow pressure, skilfully administered has succeeded and should always be tried, though many disastrous results have followed traumatism produced by the attempts to dilate the cervix, either from below or above.

An interesting analysis of the history of the condition and the attempts made to correct it has been given by Reuben Peterson(1). Should efforts at reduction fail after gentle and skilful attempts especially in the presence of infection, it is probable that relief by a cutting operation should not be undertaken until the danger of sepsis and hemorrhage is past and until involution is well advanced. The management during the chronic stage has presented interesting problems. Many patients are not seen by the operator until the tissues have become rigid and fixed. The protruding pear-shaped body has been mistaken for a tumor, indeed the writer once saw a skilful surgeon inadvertently remove the uterus on this supposition, fortunately with a favorable result. Hysterectomy has been advised but since the development of the operation by splitting and turning the uterus, there would appear to the writer to be no occasion for its adoption.

The operation as carried out by Spinelli and which was chosen in the case to be narrated is certainly no more difficult or dangerous than a vaginal hysterectomy and in the absence of tumor or other form of degeneration of the uterine wall, it will appeal to the surgeon. Accumulated experience is not at hand for the determination of the results if subsequent pregnancies occur.

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* Read before the Obstetrical Society of Philadelphia, April 5, 1917.

Mrs. F. S., aged twenty-one; was pregnant with her third child. The first labor lasted three hours, the second, two hours.

Previous to admission to the hospital, the patient being pregnant at full term had made no preparation for delivery expecting to enter a hospital. When in active labor, being refused admission at the hospital, a nearby physician was summoned and found her just delivering herself of an 8½ pound child. Absolutely no attempt at bathing or clean bed linen. The expulsion of the child was followed immediately by the placenta which appeared to drag with it the uterine body turned inside out. The endometrial surface, therefore, of the uterus protruded from the vagina and lay in contact with a soiled quilt and the unwashed thighs of the patient. There was furious hemorrhage. The placenta was separated from the uterus and the physician without any opportunity for cleaning up, crowded the uterus inside the vagina but was unable to turn it right side out as the cervical ring was firmly contracted. He introduced a gauze pack into the vagina in contact with the inverted uterus, after which the hemorrhage largely subsided. The patient was now in a desperate condition; the pulse felt with difficulty; extreme pallor and dyspnea. In this condition she was admitted to the ward of the Presbyterian Hospital in the early morning of December 2, 1916; pulse 160. Under moderate stimulation, intravenous salt solution and salt solution under the breasts in addition being given, together with small amounts of ergot and 1 c.c. of pituitrin, the pulse gradually improved and the temperature, from being subnormal, gradually rose. About twelve hours later it was thought safe to remove the vaginal packing and gently douche the vagina with its contained inversion. This was done with very hot boric solution without producing hemorrhage. The hemoglobin was 10 per cent.

The presenting surface of the endometrium now appeared red, corrugated and clean except for some shreds of clot. There had been up to this time one attack of severe abdominal pain which required morphia. There was retention of urine for the first twenty-four hours. The mass presenting in the vagina now tightly filled it. Above the pubis was the indented ring of uterine muscle around a pit at the top of the mass, which represented the point of inversion. When first seen this mass was as large as a large fist, the uterine muscle apparently not having firmly contracted. During manipulation it grew somewhat smaller. The size of the vaginal protrusion remained unchanged, and so completely filled the vagina as to make it impossible to outline the cervix.

During the first forty-eight hours there was moderate oozing for which pituitrin was given with good effect. The temperature gradually rose and reached 104; a copious, bloody, gray discharge with very foul odor appeared. The presenting endometrium was brownish-gray in color and looked as though a decomposing pellicle were separating from the surface; there were, however, no signs of peritonitis; the patient was cheerful and free from pain. There was a well-marked hemic precordial murmur. The occurrence of the marked local infection vindicated the decision which was made in the beginning that any attempt to turn the uterus right side out would be disastrous even if successful.

It was a satisfaction to see the foul exfoliating surface of the endometrium draining so satisfactorily by way of the vagina. During the next four weeks the temperature gradually declined; the odor disappeared; the endometrium became red in color; and although it always bled easily when touched it finally appeared smooth and healthy. The vaginal mass diminished in size to that of a three months' pregnancy; the inner openings of the tube could be seen as small depressions; the sulcus about the cervix was a half inch in depth. At the end of four weeks a rather copious hemorrhage occurred, doubtless a form of menstruation. Five weeks after delivery, the hemoglobin having increased from 10 to 46 per cent. and all signs of infection having disappeared, it was decided to reduce the inversion by incision of the anterior wall on the vagina after the method of Spinelli.

Operation.—Under ether the uterus was pulled into plain view from the vagina. A "T" shaped incision was made across the cervix and extending down the median line as far as the top of the fundus. The incision across the cervix served to separate the bladder for a distance sufficient to enable the entire cervix and uterine wall to be split in the middle line without bladder injury. There was very little bleeding. Upon grasping the two sides of the protruding uterus with the thumbs and fingers, it was possible to turn the organ right side out exactly as one would turn a hollow rubber ball which had been split halfway around. After turning, the peritoneal covering of the uterus together with the tubes and round ligaments presented in the vagina instead of the endometrial aspect of the organ which had before presented. The peritoneal surfaces lacked luster and were covered lightly with lymph but showed no other signs of the former infection. It was now necessary to suture the uterus before reducing the fundus into the peritoneal cavity through the cross incision under the bladder. This suturing was done in three layers with chromic catgut, the upper half being finished first and reduced through the opening under the bladder, after which the remaining half of the incision in the uterine wall was similarly sutured down to the cervix. The entire uterus was now pushed into normal position and the anterior vaginal incision closed except for a small drain. A light vaginal pack gave the proper support. Convalescence was absolutely painless and uneventful. Discharged to her home in nineteen days, walking comfortably.

When examined two months later she reported entire comfort, holding the urine for two to three hours by day, emptying the bladder twice at night. There was a thin sharp linear scar from the cervix up the anterior vaginal wall; the uterus was forward and well involuted; there had been one rather copious menstruation.

The patient presented herself this evening and may be seen to be in good health.

A question of the fate of the uterus in the event of subsequent pregnancies is a somewhat interesting one. The risk of rupture may probably be considered somewhat greater than after an ordinary Cesarean section because the line of cicatrix extends all the way from the top of the fundus down through the cervix. In pregnancy following Cesarean section the dilating strain is a gradual one through the entire nine months and mechanically the scar if well up in the uterine body may not be exposed to dangerous strain during labor. At the time of labor the dilatation of the cervix in the ordinary Cesarean would not involve any dilatation of the scar area. In this case, however, a dilating strain would be exerted on the scar area during the hours of labor and it would therefore be relatively sudden. It is an interesting question whether the ordinary processes of cervical dilatation with the sliding of the bladder and cervix out of danger, can be safely accomplished. It is probable that should pregnancy occur it will be wise to induce labor two or more weeks ahead of time.

In a late number of the Edinburgh Medical Journal reference is made to sixty-three cases of rupture of the Cesarean scar. The writer has not seen any account of a labor which has followed splitting of the entire uterus including the cervix such as occurs in the operation here described. As far as the operation itself goes, if one may judge from a single experience, it is an extremely satisfactory method of dealing with chronic inversion, as the ease with which the muscle could be turned into position was really surprising.

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1831 Chestnut Street.

HYSTERECTOMY—THE OPERATION OF CHOICE TO TERMINATE PREGNANCY, WHEN SUBSEQUENT PREGNANCY IS TO BE AVOIDED.*

BY

EMERY MARVEL, M. D.,

Atlantic City, N. J.

No consideration in this paper has to do with birth control. Neither is it intended to take cognizance of any alleged indication to terminate pregnancy, except those conditions which clearly and unmistakably hazard the maternal life through the further progress of the pregnancy.

* Read before the Obstetrical Society of Philadelphia, April 5, 1917.

It is not the wish of the writer to convey the idea which the subject of the paper might give, that hysterectomy is recommended in all cases in which pregnancy is to be terminated. It is desired to direct this application to that group of conditions, only, in which the life of the pregnant woman is threatened by the activities of her pregnancy. Such conditions imply that should a subsequent pregnancy occur, it will result in a repetition of the same dangerous manifestation, and what is more probable, with an aggravation of that danger. Extrauterine pregnancy demands an entirely different treatment and in this abnormality the indication is principally to remove the present hazard, the character of which does not contraindicate subsequent pregnancies. Malpositions and malformations are mechanical conditions and should be met as the respective case indicates. Hysterectomy is rarely indicated in the mechanical abnormalities. It is in such conditions as vicious toxemia; pernicious vomiting; active tuberculosis; serious blood diseases; certain renal and cardiac diseases; and other such diseased conditions which the pregnant process alone dangerously aggravates, or by the further progress of gestation threatens the sacrifice of the mother's life and by this impending tragedy demand the termination of pregnancy, that hysterectomy is recommended to be the choice of surgical procedure.

Mindful of the grave responsibility that is assumed by the surgeon who decides to terminate a pregnancy, this discussion is offered to consider the preferable means by which the imperative needs may be met. That which is desired to obtain is: to terminate the process of the pregnancy; to remove the products of conception; to conserve the subsequent health of the woman; to protect her against subsequent conception; and to submit her to the minimum surgical risk by which requirements may be secured.

Drugs administered for such purpose are undependable, if not useless, and deserve no favorable consideration.

The operation usually practised is dilatation of the uterine cervix and through the dilated os to remove the products of the conception. The procedure is either by slow or rapid method. Slow as practised by the introduction into the cervix of tents, spring dilators, gauze packing, rubber bags or other mechanical devices, and then waiting. Slow dilatation may be tolerated in late pregnancy, when it is not expected that the relief shall be prompt. It does not possess sufficient relative merit to commend its practice in the early stages of gestation, or any case when it is imperative to gain immediate results.

Rapid dilation assumes definite operative action. The procedure endeavors to remove the uterine contents by extracting the fetus, followed immediately by scraping away the fetal membranes. This is considered by many to be a dependable procedure and it is the method most often followed. Curetting the uterus, at best, succeeds only in removing the immediate hazard; it fails to protect against recurrence; nor does it protect against the mental anguish and unhappiness which the fear of pregnancy, with all that fear implies, occasions.

Hysterotomy, with the removal of the uterine contents together with resection of the tubes, is strongly recommended, especially by Palmer Findley. The method possesses merit for its selection in preference to curetting. This operation accomplishes many of the objects specified; it does not so well conserve the subsequent health of the woman. Certainly its employment assumes greater traumatism of tissue, longer period of operative time, and greater blood loss than does hysterectomy, and therefore, must be reckoned as being of greater surgical risk.

Hysterectomy offers the operation of choice to meet the indications as stated. Hysterectomy accomplishes all that dilation and curetment accomplishes and in addition, attains dependable protection against subsequent pregnancy. That the removal of the uterus terminates pregnancy there is no question, nor can there be doubt as to the products of the conception being removed. There may be question of doubt as to the operative risks. Let us consider these as compared to the operation of dilatation and curetting. The time period required for hysterectomy is shorter than curettage; therefore the balance of the anesthetic credit also favors hysterectomy. Certainly, none can question that the blood loss is less from a hysterectomy than curettage. If infection is to be considered, then we must think of the larger receptive surface left by the scraped uterus and the greater culture medium collection in the cavity of the uterus to be charged against curetting. Perforation of the uterus with the curette is not so rare as to be negligible, nor is the tearing of the cervix; compared to which accidents hysterectomy is free. Though hysterectomy may at first impress us as being a more dangerous procedure than curettage, analysis of the respective procedures must needs change that impression.

Hysterectomy is a preferable procedure to hysterotomy, we feel, in that it is a shorter, easier, and more certain means to an end. It is accomplished with less traumatism, shorter period of operative action, and with less hemorrhage than is hysterotomy. It might be contended, however, that the woman retains her uterus when hysterotomy has been the choice of procedure. Admitting this claim, it leaves for discussion whether the woman is not the better off by being free of her uterus. We have not found evidence to convince us that a woman under these circumstances is not the better by the uterus having been removed. If the sole purpose of the organ is to act for a receptacle to the impregnation and to cradle the conception during maturity, the argument would favor hysterectomy. Should, as some have contended, the uterus act as a secretory organ, the deprivation of the woman's organism from this secretion has not manifested itself sufficiently to convince those surgeons who have observed the greater number of women from whom the uterus has been removed. Graves (Text-book of Gynecology) states, "It has been suggested that the uterus produces a toxic internal secretion, the harmful influence of which is neutralized by the presence of the ovaries. Such a theory would account for the deleterious after-effects of double oophorectomy operations where the uterus has been left in. The theory, however, has no scientific basis, there being no evidence or probability of a uterine internal secretion." The excretory function is without convincing evidence of being a necessity in maintaining health. The freedom from the annoyance and care necessitated by the menstrual flow is welcomed, and free from the menstrual flow, a better hygienic condition prevails. It seems justified to declare that a woman under these circumstances is better off with the womb removed, especially is this true in those suffering from blood discrasies and tuberculosis, for these women need to be protected against the blood loss occasioned by menstruation. Hysterectomy conserves physical health, and more so does it conserve the mental comforts. How fearful, indeed, is she who has been at the brink of death due to pregnancy, lest she may become pregnant again. Too, if much of the conjugal happiness depends upon the favorable sexual life, as we believe it does, then it is indeed the surgeon's duty to provide for a continuance of this pleasurable experience. The amputated uterus in itself does not influence adversely the sexual pleasure, and by the removal of the uterus the mind is made free from the fear of pregnancy and given a safeguard for happiness. Hysterectomy assures against the unhappiness occasioned by such fear; favors continuance of a happy sexual life; protects against the untidiness during menstruation, and assuredly protects against subsequent pregnancy with the hazards which it entails. It would therefore seem from these reasonings that when conception is to be defeated, it is preferable to remove the uterus.

Such being assumed, hysterectomy attains more for the patient than does any other operative procedure.

The following three cases may serve for illustration:

Case I.—White woman; aged twenty-four; married four years, one child born three years ago. Incipient pulmonary tuberculosis began two years ago. Referred July 11, 1916, by Dr. Boyson of Egg Harbor, to have a four months' pregnancy terminated, which was considered imperative on account of the tubercular involvement having become active and progressive during the past two months. Both apices were involved, with moist râles present in the right apex. Patient was put to bed for ten days rest and observation. Fever increased, with night sweats and cheek flushings. The involved areas became more aggravated. Clumps of tubercle bacilli were present in sputum. Decision to terminate the pregnancy prompted certain queries to be answered. Could the tubercular activity be checked? Would stopping menstruation be a help to the woman? Was it essential to defeat subsequent pregnancy? Was it desirable to conserve the existence of sexual experience? Assuming the first question answered as possible, all the others were answered in the affirmative. Hysterectomy offered what seemed to be the preferable treatment to meet the requirements. After counsel with her physician and conference with the husband hysterectomy was performed July 16, 1916. Immediate rally and prompt operative recovery followed. The woman has been free from fever for past three months and her physical signs have improved.

Case II.—White woman; aged thirty-eight, three months pregnant. Referred December 17, 1916 by Dr. Guion. Persistent vicious vomiting and renal insufficienty for three weeks; two weeks in hospital with rectal feeding, without relief. Dr. Guion together with Dr. Philip Marvel, who was called by Dr. Guion in consultation, urged prompt termination of the pregnancy. This patient was referred to me by my brother four years previously, when after six weeks of inefficient treatment for a like condition, when feeding by rectum had been practised for four weeks, but the patient constantly lost ground until she was most near exhaustion, and then I emptied the uterus of four months' conception. It seemed evidently desirable in the consideration of the surgical care to protect this patient from another repetition. After presenting the nature of the operation and its significance to the husband and the patient, it was decided to do a hysterectomy. Prompt convalescence, which the patient compares as being more favorable in her experience than that experienced by the previous operation of curetting.

Case III.—White woman; aged thirty-four; seven and one-half months, pregnant. Referred by Dr. James of May's Landing, March 3, 1917. Seemed well previous to the morning she was referred for operation. Complained of headache in early morning. When husband returned home at noon she talked with him, but after he had gone to another part of the house, returning ten minutes later, he spoke to her but received no response. He noticed twitching of her eyes and stiffening of her arms. First convulsion was followed by frequent repetitions. Had two convulsions in ambulance traveling eight city blocks, two more in five minutes at the operating room. No fetal heart sound discernible when I saw her. There was bronchial filling, pulse 150, temperature 105°. Diagnosis: renal eclampsia. With so marked toxemia as manifested by the pulse rate, temperature, bronchial rattle and the dead child (child movements were present in the morning) I was given to doubt the wisdom of the trial to save the woman's life, and yet I realized a duty to give her the chance. Cesarean section was determined. When the child was removed areas of previous placental hemorrhage were exhibited and the endometrium offered resistance to easy cleaning. I was prompted that a more expeditious finish could be secured by hysterectomy than by closing the uterine wound, but more, I was prompted by this thought—"Here is a life jeopardized by a most profound poisoning resultant of this pregnancy. Is it not reasonable that this sponge-like uterus is holding a large amount of the toxic agent? To remove the uterus will relieve much of that which would otherwise be a burden—perhaps the last straw." A hysterectomy was done. Eight convulsions followed during the night, with a maximum temperature of 106°, pulse 160, so far as a dependable count could be made. Patient has recovered and is discharged from the hospital.

The character of the respective cases may give a basis for much consideration.

Case I.—Active and progressive tuberculosis in a young woman, a coactor in the early years of marriage life. Curettage would have terminated pregnancy; hysterotomy would have defeated subsequent pregnancy; but hysterectomy did all these operations could have done and besides conserved against the menstruating loss, and too, it was accomplished with the greater saving of operative and anesthetic time and with less blood loss than any other operative procedure.

Case II.—Demonstrates the repetition of a life in like jeopardy to that previously experienced. Should this woman not have been protected by her former operation against this near tragic condition? Was there not evidence sufficient in the testimony of her first toxemia of pregnancy to be conclusive that should she become pregnant again like serious toxemia would recur? Had hysterectomy been selected as the operation of choice four years previously, would the second serious experience not have been prevented?

Case III.—The fact which the writer is impressed in this case is that to remove the uterine sponge saturated as it was with the most toxic material in the affected organism, affords a greater opportunity to fight the remaining poison. The woman, who has exhibited renal eclampsia during pregnancy and recovered, is a prospective, if not a certain, subject for recurrence of her experience when again she becomes pregnant. Is it humane to allow so great a hazard to her life? Would she be so permitted to hazard her life with any other danger so apparent? Hysterectomy in such a case lessens the toxic factor and gives better prospect of recovery; it, too, safely protects against the recurrence.

To summarize: Only when maternal life is jeopardized (so far as consideration in this paper is concerned) is the termination of pregnancy justified.

In the preponderance of those conditions by which the pregnancy threatens maternal life, subsequent pregnancy promises a recurrence of the hazard and most likely involves an aggravation of the seriousness of that hazard.

Prevention of such recurrence, *i.e.*, subsequent pregnancy, should be provided for the woman.

She should have conserved for her the freedom to enjoy sexual experience and be free from fear of possible pregnancy which tragically threatens her.

When meeting these conditions it is evident that the woman's health and happiness is best conserved by having the non-functionating uterus removed.

Hysterectomy is the operation which best meets these requirements in that it effectually meets each and all of them, and too, the surgical risk is comparably less than it is with other operations in practice for the purpose.

THE TRUE VALUE OF CERTAIN PELVIC MEASUREMENTS

BY

JAMES LINCOLN HUNTINGTON, M. D.,

Boston, Mass.

In the methods and results of mensuration of the female pelvis, authorities differ and individuals disagree. There are numerous measurements to estimate the size of the pelvic inlet and others to show the proportions of the pelvic outlet. While these latter measurements are of very great importance, I have omitted them entirely from this paper, as it brings up a rather different problem and one that we have not gone into sufficiently thoroughly in the Pregnancy Clinic of the Boston Lying-In Hospital to yield accurate statistical results.

Of all the multitude of different diameters and conjugates, there are five and five only that have real proven, practical value—and of these, one, like the equator, is an imaginary line, at least during lifetime. These five are the intercristal—which is the greatest distance between the flaring superior margins of the crests of the ilia. (Practically all authorities agree on the method of obtaining this measurement.)

Next the interspinous or the distance between the anterior superior spines of the ilia. Here we find a very marked difference in the method of obtaining this measurement. Practically all the obstetrical authorities measure from the outside of each spine. Ahlfeld, the famous teacher, and for years in charge of the Marburg Frauen-Klinik, however, measures from the middle point of each spine—the apex, as it were; while this is very easily made out, as it makes the result just about 2 cm. shorter, it would be well to have the method of obtaining the interspinous measurement definitely settled. Both methods have been in use at the Pregnancy Clinic of the Boston Lying-in Hospital.

The external conjugate, or anteroposterior diameter, is the distance between the depression below the last lumbar vertebra and the symphysis pubis; another method of obtaining the posterior limit of this measurement is by taking a line joining the posterior superior spines of the ilia and marking a point one inch above this line at its middle point.

The two internal measurements are the diagonal conjugate and the conjugate vera.

The diagonal conjugate is the distance between the lower border of the symphysis pubis and the promontory of the sacrum. Unfortunately, the diagonal conjugate is occasionally called the oblique conjugate, sometimes the oblique diameter, and often the internal conjugate, a term which is also often applied to the conjugate vera.

The conjugate vera is the distance between the upper border of the symphysis pubis and the promontory of the sacrum. This is the measurement of the greatest importance, and the scale by which according to nearly all authorities, the pelvis is regarded as normal or contracted. Now the conjugate vera is a measurement practically impossible to obtain directly during lifetime. Many instruments have been invented for obtaining this measurement, but none of them have proven sufficiently valuable to have more than a passing vogue and most authorities are content to consider the conjugate vera as an imaginary line, and to estimate its proportions by subtracting from the diagonal conjugate 1½ to 2 cm.—according to the height, width, and inclination of the symphysis pubis.

Emmons, in his Boylston Prize Essay for 1912, shows that in the American Indian squaw—the Indian race is practically free from rachitis—from the measurement of 217 pelves, that there is a difference of from 0.8 of a cm. to 3.2 cm. between the diagonal conjugate and the conjugate vera. This certainly further complicates the exact estimation of the true conjugate!

Now what are the dimensions of the pelvis? Ahlfeld gives the intercristal as 28, the interspinous as 24, and the external conjugate from 19.5 to 20 cm. He gives the true conjugate as 11 cm., and estimates a subtraction of 1.8 to 1.7 cm. from the diagonal conjugate. Bumm gives the intercristal as 29, the interspinous as 26, and the external conjugate as 18 to 20. Tweedy, of Dublin, gives the pelvic measurements as 29, 26, 21. Jellett, Tweedy's successor at the Rotunda Hospital, regards 28 to 29, 26.5 and 20 as the average for the pelvis. Cragin gives 28, 26, and 20; while Williams, of Johns Hopkins, gives 29, 26 and 21. Emmons found 25.7 to be the average intercristal measurement in his series of pelves of the American Indian, and 22.6 was the average for the interspinous. He found the average for the diagonal conjugate to be 11.7 cm.

In a series of the first 100 normal deliveries from the Pregnancy Clinic of the Boston Lying-In Hospital in the year 1916, the three external measurements averaged 28.2, 24.4, 20.7. This compares very closely with Ahlfeld's figures.

During the year 1916, of the patients under the care of the Pregnancy Clinics of the Boston Lying-In Hospital, 1952 women were delivered in the Hospital and in the Out-Patient Department. 89.8 per cent. were delivered normally. The pelvic measurements of these 1952 women have been tabulated as follows:

1033 had external pelvic measurements of 27, 24, 19 or over.

Of these 1033 with ample external pelvic measurements: 86, or 8 per cent. had operative deliveries, 2 resulted in craniotomy, 19 in high forceps, 7 breech extractions, or versions and extractions,* 15 Cesarean sections, 44 low forceps.

Of these eighty-six cases, four had promontories which could be reached, and diagonal conjugates which measured under 11.5 cm., and were delivered by Cesarean section. There were three other cases with normal external measurements but diagonal conjugates of under 11.5 cm.; all of these had normal deliveries. Therefore, in spite of the external measurements, these seven are really contracted pelves and will be considered so.

Nine hundred and nineteen had external pelvic measurements of less than 27, 24, 19, which is 47 per cent. Williams reports that 75 per cent. of the cases in the Johns Hopkins Clinic showed some degree of pelvic contraction. Of these 919, 115, or 12.5 per cent. had operative deliveries as follows: 2 resulted in craniotomy, 22 in high forceps (13 were classified as midpelvic),† 14 breech extractions or versions and extractions, 39 low forceps, 40 Cesarean sections.

Now of these 1952, 72, or 3.68 per cent. showed a diagonal conjugate of less than 11.5 cm., or an external conjugate of 17 cm. or less. Williams says, "From the statistics of Reynolds, Crossen and myself, derived from Boston, St. Louis, and Baltimore, respectively, it would appear that contracted pelves occur in from 7 to 8 per cent. of the white women of this country." These 72 I have grouped according to the types as revealed by external pelvimetry:

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*This series includes one case of twins. Low forceps on first; version on second.

† This series includes two cases of twins. First low forceps and version, second both forceps.

Seven normal externally: 3 normal deliveries, 4 Cesarean sections.

Thirty-two flat pelves: 20 normal deliveries, 1 low forceps, 7 Cesarean sections, 2 high forceps (both classified as mid), 2 craniotomies.

Twenty-four generally contracted pelves: 15 normal deliveries, 8 Cesarean sections; 1 internal podalic version and extraction.

Seven generally contracted flat pelves: 4 normal, 1 low forceps, 2 Cesarean sections.

Two generally contracted rachitic pelves: 1 normal, 1 Cesarean section.

Grouping these 72 together there were 43 normal deliveries, 2 low forceps, 1 internal podalic version and extraction, 22 Cesarean sections, 2 high forceps, and 2 craniotomies.

In 35 cases, either the promontory could not be felt, or the diagonal conjugate was not recorded.

Of these 35 cases 31 had normal deliveries, 3 Cesarean sections, and 1 high forceps.

The remaining 37 are summarized as follows: 8 with diagonal conjugate between 10.5–11.5 cm.: 3 normal, 3 Cesarean sections, 1 internal podalic version and extraction, and 1 high forceps.

Twenty-five with diagonal conjugate 9.5–10.4 cm.: 10 normal, 1 low forceps, 12 Cesarean sections, and 2 craniotomies.

Two with diagonal conjugate 8.5–9.4 cm.: 2 Cesarean sections.

One with diagonal conjugate 7.5–8.4 cm.: 1 Cesarean section.

One with diagonal conjugate 6.5–7.5 cm.: 1 Cesarean section.

Mortality results in these 72 cases: 72 mothers and 66 babies were discharged well, three babies died, three were stillbirths.

Causes of death: 1. Cesarean section; the baby developed erysipelas without any apparent cause; the diagnosis was somewhat in doubt, as the mother was under treatment for syphilis; the baby died on the twelfth day.

2. Spontaneous breech delivery: (primiparous) mother examined in the hospital before the onset of labor under gas-oxygen anesthesia; premature labor; baby very small—4½ pounds; easy normal delivery under primary ether; the baby died eighteen hours later, August 21, 1916; very hot day.

3. Internal podalic version and extraction: after diagnosis of anencephalic monster had been made, and the undeveloped head had failed to engage; the patient had been examined twice in the hospital during pregnancy; question of Cesarean; this operation had not been performed because the condition had been diagnosed; the monster lived 1½ hours.

Causes of stillbirth: 1. Breech delivery (multiparous), three previous normal deliveries; the externe found a foot protruding from the vulva, on his arrival at the patient's house; the house-officer was summoned and the baby was lost because of difficulty in extracting the after-coming head.

2. Craniotomy; the mother was a primipara who applied to the

Pregnancy Clinic three months before the expected date of confinement; the contracted pelvis was diagnosed and she was urged to return in two weeks; she never came back and we were unable to trace her. She was sent in to the Boston Lying-In Hospital by a private physician, who saw her in consultation after she had been three days in labor, and the baby was dead *in utero*.

3. Craniotomy; the mother was a para-vii, having this previous obstetrical history: first and second labors normal, third instrumental, child living and well; fourth, normal, and fifth instrumental, child living and well; sixth prolapsed cord, version and extraction, stillborn. Examined in the hospital and Cesarean was advised; husband refused consent for Caesarean as an elective operation and again after the patient started in labor; when os was fully dilated, as head would not come down, craniotomy was performed.

Thus, in dealing with true contracted pelves, we had a maternal mortality of zero and we had an unexplained fetal mortality of practically zero. This shows the value of the careful antepartum study our patients receive in the Pregnancy Clinic, and especially the value of our system of consultation with the senior members of the Staff in all doubtful cases.

It is evident that in measuring the pelvis, it is of primary importance to have uniformity in the use of terms and uniformity in the methods used in obtaining results. And here I should like to make an appeal for the uniform use of the term "diagonal conjugate," and for an immediate estimate and record in each case of the conjugate vera, based on the height, inclination and thickness of the symphysis pubis. I feel that the term "internal conjugate" is unfortunate and should be discontinued, as both the diagonal conjugate and the conjugate vera are equally internal conjugates.

The external pelvic measurements should only be taught as having value in determining the type of pelvis we are dealing with. As a guide to the probable outcome of the case, or the character of the labor the patient is going to have, external pelvic measurements are never to be depended upon. They never can, and never should, take the place of an internal examination, the latter should always be taught as the vital part of the antepartum examination; to examine each case a few weeks before the expected date of confinement and see if that particular presenting part has entered, or can enter, that particular pelvis. In cases of doubt, repeat the examination under an anesthetic, and where the outcome is still in doubt, insist upon hospital treatment, so that, should the presenting part fail to engage and descend, after a moderate test of labor, Cesarean section may be promptly and safely performed.

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8 Gloucester Street.

CERVICAL REPAIR FOLLOWING CONFINEMENT.*

BY

TITIAN COFFEY, M. D.,

Consultant in Obstetrics, Los Angeles County Hospital,
Los Angeles, California.

It is my desire to present for your consideration a matter that, to my mind, is too frequently neglected by those of us who practice obstetrics, either as specialists or general practitioners.

This is the damage done the cervix at the time of childbirth and the advantage of what is called the intermediate repair. For many years it has been my routine custom to examine all cases six weeks after confinement, but not until I began routine examination and repair on the ninth or tenth day following confinement, did I realize in how many cases more or less damage had been done the cervix—even in so-called normal ones; that is, in those who had had no instrumental interference and also in what a large number subinvolution of the uterus and backward displacement had occurred.

About eight years ago, following the teachings of these observations, and also the suggestions of Hirst, in regard to intermediate cervical repair, I began this routine examination of all cases on the ninth or tenth day after confinement, and to repair the cervix if necessary. My observations coincide with what I find in the literature, in regard to damage done at this time. About 80 per cent. of all the cervices are more or less damaged at the time of confinement. I have not had the opportunity of tabulating a long series of cases, and securing the percentage of primiparæ injured, or of the operative cases, but hope to do so at some future date.

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* Read before the Southern California Medical Society, Fifty-sixth Semi-annual Meeting, Redlands, California, May 3, 1917.

There are many factors that act as causative agents in this condition. Most important of all, probably, is malposition of the presenting part, such as face, brow, and breech presentations; early rupture of the membranes, especially in small pelves, where the prolonged stretching and pressure from the presenting part causes the cervix to become thick and edematous; sudden and forcible expulsion of the presenting part through the cervix, as noted with tremendous pains, sometimes accompanying the latter part of the second stage; also after the use of pituitrin; artificial dilatation of the cervix, either manually, instrumentally or by the use of bags; the use of forceps, either improperly applied, used as rotators, or where the head is forcibly pulled through a partially dilated os; intrauterine manipulations, as when performing version; rigid os; cicatricial induration and cystic or malignant disease of the cervix, rendering the tissues friable and soft.

Practically the only symptom of this condition is hemorrhage to a greater or less degree, following the birth of the child. The hemorrhage does not occur at the time of the laceration, because it is controlled by the head, shoulders, and body of the child, making pressure as they come through the birth canal. Occasionally, we get a sharp, quick hemorrhage, immediately following the birth of the baby, and if this is not accompanied by the birth of the placenta, we should immediately be suspicious of a severe cervical laceration. My experience has been that this hemorrhage, in a vast majority of cases, does not occur until after the birth of the placenta. This is probably due to the fact that the uterus, retracting and contracting, lowers itself materially into the pelvic cavity; at the same time, the placenta, especially in cases in which it loosens immediately or a few minutes after the birth of the child, exerts a certain amount of pressure and thus controls the bleeding.

The diagnostic point of cervical hemorrhage is active bleeding following the birth of the child and the placenta, with the uterus firm, well-contracted and low in the pelvis, as it should be immediately following birth. If, on the other hand, the uterus is soft and boggy, and shows sluggishness in contracting, we may feel pretty certain we have to deal with uterine inertia and uterine hemorrhage. The control of this hemorrhage, unless the cervical artery has been torn, or the laceration has extended high into the broad ligament, is usually easy. Brisk massage of the uterus, pushing it well down into the pelvis and keeping the limbs of the patient firmly pressed together, will usually stop it in a few minutes. Should these measures fail, a rapid insertion of a vaginal tampon, making pressure against the anterior and posterior lips, and getting the gauze well up into the fornices, will usually suffice. Very rarely is it necessary to expose the lacerations and ligate the bleeding points, or make an immediate repair for its control, although in a few cases in the past eight years I have found it expedient to do so.

The nature of the laceration varies with the severity of the labor and the amount of damage done the tissues. By far the most common variety is the ordinary bilateral tear extending on either side, anywhere from a slight gaping to a half or an inch, or to a complete laceration involving the cervical and vaginal junction. The unilateral tear is the next most common, and I have come to expect it in posterior positions of the head, and in cases of deep transverse arrest, where labor is prolonged, or where forceps are applied and the head grinds around the lateral pelvic wall three-eighths of a circle. In these cases the cervix is frequently under tremendous pressure, and is usually not well drawn up over the head, the edges being easily palpable to the examining finger; therefore it is liable to injury from pressure, or is torn by the forceps. The stellate tears are more apt to occur in cases of rigid os, in instrumental dilatation of the cervix, as when using the Bossi dilator, and in difficult forceps operations.

The cervix, immediately after birth, presents the appearance of a jelly-like mass, about the consistency of liver, soft, flabby, dark blue in color, very edematous and overstretched. For this reason, I am opposed to the immediate repair of the cervix, except in cases where it is absolutely necessary to control alarming hemorrhage. The parts are so distorted and bruised at this time, that sutures do not hold, and it is difficult to get the proper approximation and allow for what will be the new external os. By the ninth or tenth day, however, the tissues have so regained their tone that they are easily approximated and repaired. The character and extent of the laceration naturally varies with the amount of damage done the structure, and it is almost impossible to tell without visual examination. In judging this damage, the feel of the cervix to the examining finger is very deceiving, and many times I have thought there was little or no laceration, from the sense of feel, and have been surprised at the condition of the cervix when exposed by the speculum. By the ninth or tenth day, when the cervix is thus exposed, its size is little larger than normal and the evidences of injury are easily demonstrable. The color is usually healthy in appearance; but occasionally there may be observed small areas or patches of slough, and in many hemorrhagic spots, as evidenced by areas of blue discoloration. The torn lips are covered with a thick glaring, tenacious mucus, usually bloodstained. The lacerated surfaces are covered with fresh granulations that bleed freely. In some cases the everted lips present a veritable cauliflower appearance, covered with soft, bright red, spongy granulations, at times from an eighth to a quarter of an inch in height. Very frequently, we find these granulated surfaces thickly studded with hypertrophied cervical glands, causing the tissues to look as if they had been powdered with sago. It stands to reason that a cervix left in this condition following childbirth will later become hypertrophied, will undoubtedly prevent involution of the uterus, and will eventually cause the patient extreme annoyance and many distressing symptoms. Very rarely do I find a cervix that is completely healed, covered with mucous membrane, and presenting the appearance of a multiparous os. Occasionally, I have seen it in women who have borne a number of children, and who have had quick, easy deliveries. In these cases, the external os has been more or less patulous throughout pregnancy, the cervix has been quickly and easily dilated, and practically no damage has been done, other than the original injury at the first confinement.

The technic of repair is as follows: the morning of the operation, usually the ninth or tenth day after delivery, an enema is given early to assure an empty rectum, and the local surgical preparation is made before the patient is brought to the operating table. No internal manipulation is allowed. The patient is instructed to empty the bladder before coming to the operating room. The patient is placed in the exaggerated lithotomy position, as it is very important to have the hips well over the edge of the table, thus facilitating the manipulations and making it easier to draw the cervix forward. She is then given an external flush of 1 to 2000 bichloride solution, followed by sterile water. An internal douche of 1 per cent. lysol solution is then administered until the water returns clear, thus washing out all discharge from the vagina. No internal scrubbing is permitted. In cases where perineal sutures have been introduced, these are allowed to remain until after the operation, as they act as a support to the structures and prevent damage or tearing out of the newly healed tissue.

A trivalve speculum is then very carefully introduced in a downward, backward direction, following the posterior wall of the vagina in such a way as not to disturb the perineal sutures. Upon exposure of the cervix, the anterior and posterior lips are seized as near the center as possible, with a single grasp volsellum forceps and drawn into view. The trivalve speculum is then withdrawn, and with equal care, a light weighted speculum introduced. Care should be taken not to make too much traction, as it frequently causes pain, and it is not necessary to drag upon the cervix at all, nor to bring it out of the vagina. The torn lips, after being carefully sponged off, to remove as much of the bloody mucous as possible, are then injected with a 1 per cent. novocaine solution, to which has been added one drop of 1 to 1000 adrenalin solution. Not more than 10 c.c. is used, taking particular care to inject the solution well into the angles of the laceration, for I find this is the most sensitive point when the sutures are passed. The addition of the adrenalin blanches the structures so the operation is practically bloodless. The edges of the anterior and posterior lips on the left side are then trimmed off with curved scissors, care being taken to remove only the granulation tissue and not cervical tissue. After the edges are freshened in this manner, the surfaces are gone over with a large, sharp curet, until one is down to the base structure. We then have two clean surfaces ready for approximation. The lips are drawn together with sutures, using No. 2 ten-day chromic catgut, starting well at the upper angle to secure perfect coaptation. This is very important, for otherwise a sinus is sometimes left at this point, that usually is permanent and discharges a considerable amount of mucous for a long time. Occasionally, I use interrupted sutures, or a simple running suture, when it seems advisable, but ordinarily I use an interlocking suture, beginning a trifle above the upper angle of the laceration and running right down to the tenacula, which have previously been placed as accurately as possible in the center of the lips. Usually three, sometimes four, bites of the needle, are all that is needed for the closure. The opposite side is repaired in the same way, and at the completion of the operation, we have, instead of a badly lacerated, exposed and granulated surface, a neatly closed cervix with a new os, just large enough to pass a uterine sound. This latter is always passed before the removal of the tenaculæ, to ascertain the patency of the new canal. The perineal sutures are then removed, another lysol douche given, the cervix placed far back in the pelvic cavity, and the operation is complete.

To my mind, the advantages of this operation are very great.

1. The repair of these lacerated structures hastens and insures a speedy and normal involution of the uterus, and has much to do with preventing subsequent metritis and endometritis.

2. With proper involution of the uterus, the patient does not run so much danger of backward displacement of this organ, and over-

stretching of the ligaments, due to a soft, boggy, poorly involuted uterus.

3. There is no loss of tissue such as occurs when we repair a greatly hypertrophied cervix filled with scar tissue.

4. It does away with the necessity of the patient's returning to the hospital for future operative work, and certainly must lessen the danger of malignant disease at a later period in life.

5. The approximation and healing is perfect, and the scar-tissue so trivial that it does not interfere in any way with subsequent dilatation of the cervix at future pregnancies.

6. The sense of pain in the cervix is practically nil, except, as I have stated before, at the upper angles of the wound, and is probably due to exposed nerve endings.

7. A general anesthetic is not needed, therefore the patient is saved this risk. The operation is easily done under local anesthesia; in fact, I have frequently done it with no anesthetic at all, and with no complaint from the patient. I have only twice seen ill effects from the novocaine solution, and as the symptoms came on immediately following the injection, I must have struck a vein and caused too quick absorption. The symptoms were shortness of breath, pallor and dizziness, but these were quickly overcome by inhalations of aromatic spirits of ammonia, since then, I am accustomed to give ½ ounce of whiskey to the patient just before being brought to the operating room. Only twice in a series of over 500 cases, have I found it necessary to give a general anesthetic; this was due to the fact that patients were of highly organized nervous temperaments, who became hysterical at the mere thought of operation without a general anesthetic. The patients complain more of the position and the discomfort of the speculum than of the operation itself.

8. This operation does not interfere with the patient being up and around, nor with her going home at the end of the fourteen days after confinement.

9. At the end of six weeks, the results are most gratifying; cervix normal in color and size, no cervical discharge, perfect union by primary intention, and a pinhole os that looks, in many cases, as if it were a nulliparous os, and it would be hard in some to tell a woman had ever borne a child.

The principal objection raised by those unfamiliar with this work is that such a procedure is meddlesome interference, that the danger of sepsis is too great, and the operation should be postponed to a later date, when further involution has taken place. I can personally only say that I have convinced myself so thoroughly of the advantages of this repair work that I would be ashamed to have a patient leave the hospital with the cervix in the condition one so frequently finds when patients come for a trachelorrhaphy following a laceration of long standing. I have never seen a case of infection follow this operation, and I believe if one's technic is correct it will not follow. Of course, in cases that run a little temperature from a low-grade endometritis following childbirth, in those that have developed infection of a more severe character, in those suffering from phlegmasia alba dolens, or having any inflammatory condition of the pelvis, the operation should not be performed; but in a perfectly normal case, with normal temperature, it is absolutely safe, provided one's technic is carefully watched.

When I first began this work, I noticed occasionally a cessation of the lochial discharge, lasting from a few hours to twenty-four or thirty-six hours, accompanied by a sudden rise of temperature. Naturally, I was very much alarmed, but I soon realized the condition was due to improper drainage of the uterus, and a damming back of the lochia. This also sometimes occurs where the new os has been touched with 5 per cent. nitrate of silver, on account of granulation tissue, at the completion of the operation. The silver causes a temporary closure by apparently sealing the os over, and thus prevents free drainage from the uterine cavity. All this is now avoided by having the patient placed in the Fowler position immediately after the operation, thus assuring adequate drainage. If the lochia has ceased for a few hours, it is generally resumed within twenty-four hours, by a very free flow with an immediate drop of temperature to normal. It has never been necessary to reexamine a case for this condition, to remove sutures, nor dilate the os, as it has always been overcome by posture.

After-treatment consists simply in keeping the patient in the Fowler position from the time she is returned to her bed, and the usual surgical, external cleansing of the parts, no douches being needed or given. The patient is usually allowed to sit up in a chair on the day following the operation, takes a few steps about the room on the twelfth day, and leaves the hospital, if she so desires, on the fourteenth day.

I have discarded the use of the knee-chest position, in favor of the kangaroo walk, beginning this on the tenth or twelfth day, according to the strength and general condition of the patient. Since using this exercise, I have been more than gratified at the improved condition of the patient at the end of six weeks. The kangaroo walk causes a rocking motion, thus massaging the uterus and ligaments, and materially hastens involution. I now frequently find, at the end of four weeks, the involution is further advanced, the uterus smaller, anteflexion and position more normal than at the end of six weeks, when using the knee-chest position. It is a great comfort to have your patients leave your care with a well-involuted uterus, anteflexed, in proper position, no cervical laceration, and no retrodisplacement to torment and reflect upon you in the future.

SUITE 926, MARSH-STRONG BUILDING.

PREGNANCY AND LABOR FOLLOWING OPERATIVE PROCEDURES ON THE GENITAL TRACT.*

BY

JOSHUA RONSHEIM, M. D.,

Brooklyn, N. Y.

THE frequency with which women upon whom some pelvic operative procedure has been performed come to grief in a subsequent pregnancy or labor, has led me to present this subject to you.

While the most serious of these cases are those in which the operative procedure involved the body of the uterus, the effects of operative interference on the perineum or cervix are not without interest. Secondary perineoplasty, in which the levatores ani are united anterior to the rectum, usually produce dystocia at the pelvic outlet as is shown in the following cases:

CASE I.—Mrs. B, aged thirty, a para-ii had a perineoplasty performed in 1913, four years after the birth of her first child. Her second labor began at 3.00 P. M. Examination three hours later showed a high rigid perineum, very roomy vagina, cervix effaced and os two fingers dilated, membranes ruptured, and vertex presentation in the L.O.A. position. At 7.30 P. M. the head reached the perineum and patient was making forcible expulsive efforts. It was interesting to watch the head strike violently against this barrier with each pain. After forty minutes of unsuccessful pounding the patient was anesthetized and a median episiotomy performed. The baby was then expressed with ease and perineum resutured.

CASE II.—Mrs. R., aged twenty-nine, a para-ii, underwent a perineoplasty in 1911, two years after the birth of her first child. Her second labor progressed rapidly until the head reached the perineum where its further progress was arrested. Under anesthesia an attempt to dilate this perineum proved unsuccessful, so an episiotomy was done followed by forceps delivery. These cases illustrate the necessity of early episiotomy to avoid extreme pressure on the fetus and the possibility of ragged tears of the perineum.

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* Read before the Brooklyn Gynecological Society, May 4, 1917.

The Emmet-Baldwin operation for the cure of prolapse and cystocele does so by the production of a dense band across the vault of the vagina just anterior to the cervix. The following case came into my hands in December, 1914:

Mrs. C., aged thirty-one, a native of Italy, had had three normal deliveries. Some time after the birth of her last child she was subjected to this operation. I saw her nineteen hours after the onset of labor. There was a well-defined retraction ring palpable just above the symphysis. On vaginal examination a dense fibrous band was felt stretching across the vault of the vagina completely obstructing the descent of the fetal head into the pelvis. After hooking the examining finger behind this band the cervix was found to be completely dilated, head in the L.O.P. position at the brim, membranes ruptured. Under anesthesia this band was exposed to view and severed after which the occiput was easily rotated anteriorly and delivered with forceps. The baby had repeated convulsive seizures and died forty-eight hours after delivery. Its death was undoubtedly due to the prolonged second stage; the autopsy was negative throughout. The mother made a perfect recovery; with a little longer labor however she might have ruptured her uterus.

Repair of old lacerations of the cervix and amputation of the cervix in themselves are frequent causes of dystocia, but when combined with vaginal, vesical, or ventral fixation its importance is nullified by the greater dystocia produced by the uterine fixation. Pure cervical dystocia is illustrated in the following three cases:

CASE I.—Mrs. S., a native of Russia, aged thirty-two, was admitted to the Jewish Hospital, April 30, 1914. At the age of twenty-two she had a miscarriage. Since then she had had three normal deliveries, the last one two and one-half years ago. After the birth of her second child she was subjected to a perineoplasty. This was followed by a normal delivery. Following the last labor a trachelo- and perineoplasty was done since which time she has had more or less constant pain in the perineum, the etiology of which will shortly be explained. At 8 P. M., April 30th labor began and coincidently the membranes ruptured. Examination showed a good perineum, a cervix of considerable length and high in the pelvis, one finger dilatation at the internal os and no presenting part. After twenty hours of good labor the condition was the same and at this time a number four Voorhees bag was inserted; this bag was expelled thirteen hours later. The patient was then anesthetized and examination revealed a shoulder presentation in the R. Scap. Ant. position. While attempting to dilate the perineum it suddenly split down to the sphincter ani with a discharge of a large amount of a mucopurulent material. This was evidently an occlusion cyst resulting from the last operation and explained her constant pain. The child was easily delivered by version and extraction. The perineum was repaired and mother and child left the hospital on May 16th.

CASE II.—Mrs. F., aged twenty-eight was admitted to the Jewish Hospital, Feb. 27, 1916. In 1913 her first pregnancy was terminated by a forceps delivery with extensive laceration of the cervix. This was later repaired with a fair result. When I saw her she had had about sixty hours of irregular labor. Her cervix was 1 inch long, two fingers dilated and bilaterally lacerated with bands of scar tissue radiating from the angles of the laceration into the vault of the vagina. The vertex was engaged in the brim in the R.O.P. position and membranes ruptured. At this stage she was transferred to the hospital where, after thirty-six hours more of labor, in the last twelve of which the pains were extremely severe, the cervix was unchanged. She was then anesthetized and the cervix incised bilaterally, after which a Scanzoni rotation and forceps delivery were easily accomplished.

CASE III.—Mrs. B., aged thirty-three, came to me in September, 1916. Her first labor in 1907 and her second in 1909 were instrumental deliveries. In November, 1913 she was operated, at which time an anterior colporrhaphy, amputation of the cervix, colpoperineorrhaphy, and ventral suspension by the round ligaments were performed. Labor began at 10.00 P. M., October 13th, the membranes rupturing at the onset. On examination at midnight it seemed as though the cervix was completely dilated and the membranes intact, but on careful search what seemed to be the bulging bag of waters was in reality the thinned-out remains of the cervix with a puckered dimple at the center representing the agglutinated os. After four hours more of hard labor the condition was the same. At this time I forced my finger through this puckered dimple and was rewarded by having the thinned-out tissue retract leaving a well-defined cervical ring with three fingers dilatation. The head was now found to be in the L.O.P. position floating at the brim. Three hours later the cervix was completely dilated with head in the same position at the brim. Version and extraction were accomplished without difficulty.

While hebosteotomy is performed primarily in the interest of the child it may be of possible value in subsequent labors in that it may produce a permanent enlargement of the pelvic diameters. Williams states that healing occurs more frequently by fibrous union; this should be regarded as a favorable outcome as it sometimes leads to slight enlargement of the pelvic diameters, which may be still further accentuated in a subsequent pregnancy by the softening and relaxation incident to the increased hyperemia attending this condition. Occasionally this may be sufficient to permit spontaneous labor which occurred in several of his cases. This is especially the case in funnel pelvis.

De Lee states that permanent enlargement of the pelvis was noted by him after symphyseotomy, but makes no mention of it occurring after hebosteotomy.

Bumm makes no reference as to permanent enlargement of the pelvis.

Döderlein states that following hebosteotomy immobilization of the pelvis should not be performed, in the hope that the diameters of the pelvis may be permanently enlarged.

Fabre makes no mention of the permanent enlargement of the pelvis following hebosteotomy.

My personal experience with labor subsequent to hebosteotomy is limited to two cases.

The first was a primipara who came into the hospital with a breech presenting; in this case the operation was performed to permit of the delivery of the after-coming head. She recently had a spontaneous delivery. Unfortunately the pelvis was not measured at the second delivery, but, in view of the fact that we were able to demonstrate a decided amount of mobility at the site of the operation, it is reasonable to suppose that in this case there was some permanent enlargement. The second case was that of a young woman of twenty-four, a native of Austria who was admitted to the Jewish Hospital, October 1, 1914. She had had rickets in infancy and began to walk when she was three years old. In May, 1913, a hebosteotomy was performed at Cologne. How the child was delivered is not known, but it was evidently a difficult delivery since it died fifteen minutes after birth. Her present labor began thirty-six hours before admission. Her whole appearance spelled rickets. Her measurements were IS 26, IC 29, EC 21, DC 9, TC 7.5. The cervix was long, one finger dilated, and was the seat of multiple lacerations especially on the right side where a tear extended high into the broad ligament. Aside from the scar above the pubic bone on her left side no evidence of a previous hebosteotomy could be found; the bone was firmly united and without exostosis. Considering the condition of the cervix, the pelvis, and the previous delivery I concluded that an abdominal section was the proper procedure. Mother and child left the hospital on the sixteenth day.

SUSPENSION AND FIXATION OF THE UTERUS.

When the gynecologist operates for displacement of the uterus he must consider not only the retention of the uterus in its normal position, but also the rôle of the uterus during pregnancy and parturition. In this respect the various operative procedures vary widely; in some, disturbances during pregnancy and labor are hardly noticed, while in others they are relatively common. Least troublesome of all are those in which the suspension is by means of the round ligaments. First in this class is the Alexander operation, because the free mobility of the uterus renders disturbances highly improbable; likewise in the Gilliam and Webster-Baldy operations, for in these the uterus can conform to all physiological movements including those of pregnancy and parturition. The Coffey plication is not quite as satisfactory as the others and has been known to so bind down the anterior wall of the uterus as to cause sacculation of the posterior wall of the uterus in a pregnancy following this operation. Next are those operations in which the body of the uterus itself is suspended from the abdominal wall and most troublesome of all are those in which abdominal, vaginal, or vesical fixation has been performed either intentionally or accidently. Kelly states that when there is a possibility that impregnation may take place after operation care should be taken to suspend and not fix the uterus. If fixation is done on a woman still able to conceive she should at the same time be sterilized, and this is probably the opinion of all operators to-day.

In pregnancy following suspension and fixation numerous complications may arise of which pain is perhaps the most constant. This is due to stretching of the shortened ligaments and pulling at the point of suspension. Abortion and miscarriage do occur following these operations but one must bear in mind the fact that these operations are often performed in an attempt to overcome habitual abortion resulting from retrodisplacement of the uterus. In fixation abortion is quite frequent; Strassman reports 25 per cent. A common result of suspension is premature labor, the great majority of labors occurring early in the ninth month. This, however, is of no consequence. It is also likely that prolapsed cord or arm, placenta previa, retained placenta, and postpartum hemorrhage are predisposed to by these operations.

All those methods which bring the retroflexed uterus into anteversion and at the same time fix the body of the uterus more or less firmly, viz., ventro-, vagino- and vesico-fixation, may interfere seriously with the development of the uterus during pregnancy. As a result of this fixation the following conditions develop during the pregnancy: The posterior wall of the uterus is used as a gestation sac and becomes extremely stretched and thinned out; coincident with this the cervix is steadily drawn higher and higher above the promontory. If the fetal head descends into the true pelvis there is produced a bulging of the anterior wall of the uterus between the point of fixation and the anterior lip. On examination, although the head may be deep in the pelvis it is covered by the thinned-out portion of the lower anterior segment, while the cervix can be felt high above the promontory.

With the occurrence of pains the cervix dilates, though slowly and incompletely, and as a result of the contraction of the posterior wall the posterior lip of the cervix is steadily drawn still higher above the promontory. The lower and more firm the fixation the worse is this condition. If the fixation is not too low down on the anterior wall the displacement of the cervix posteriorly and the thinning out of the anterior lower segment of the uterus may not be encountered and normal delivery becomes possible. Kaufman observed a case in Olshausen's clinic in which the vagina was drawn up into the abdomen and in which he had to insert the entire forearm before the cervix could be reached. Often, however, the presenting part does not enter the pelvis but follows the cervix upward and during labor is directed toward the promontory; in other words the long axis of the uterus is at right angles to the birth canal; as a result labor is interfered with and birth does not follow. Again, in some cases, as a result of the mechanical pressure of the anterior abdominal wall the uterus develops more in its breadth than in its length and the fetus, conforming to the change in the shape of the uterus, assumes a transverse position.

In fixation, should the pregnancy go to term, 33 per cent., according to Kleinwächter, require operative delivery; in 15 per cent. of the cases he found transverse position which position he considers favorable under the existing conditions although it always demands operative delivery. He considers it favorable because it is possible to bring down a leg through the displaced cervix; this procedure brings the cervix down into its proper relation with the pelvic canal and permits of a breech extraction.

With the cervix dislocated above the promontory and child in vertex presentation spontaneous expulsion is impossible and operative delivery through the vagina is very difficult because the long axis of the uterus being at right angles to the lower part of the birth canal renders the rational procedure, viz., version, practically impossible, and it becomes necessary to do abdominal or vaginal hysterotomy.

I have records of nineteen cases that were operated for uterine displacement and subsequently delivered; these include

Alexander	2 cases
Olshausen	1 case
Webster	3 cases
Gilliam	1 case

Coffey	2 cases
Kelly suspension	2 cases
Intraabdominal shortening of round ligaments	2 cases
Coffey and Olshausen combined	1 case
Vaginal suspension	2 cases.
Vaginal fixation	1 case
Accidental fixation	1 case
Plication of broad ligament over perforation	1 case

Eleven of these cases had no dystocia attributable to the operation previously performed and were delivered normally or by simple operative procedures. They included

Coffey	2 cases
Webster Baldy	3 cases
Olshausen	1 case
Kelly	1 case
Alexander	1 case
Intraabdominal shortening of round ligaments	2 cases
Plication of broad ligament over perforation	1 case

One normal delivery following a Webster-Baldy suspension had a severe postpartum hemorrhage six days after delivery; this was controlled by injection of pituitary extract.

The remaining eight cases were terminated as follows:

Version and extraction
1 Guilliam
1 Alexander
Abdominal Cesarean section
1 Kelly suspension
1 Coffey and Olshausen combined
1 Vaginal fixation
2 Vaginal suspension
1 Accidental fixation

The findings in the cases terminated by abdominal Cesarean section are, I believe, of sufficient interest to be reported.

Case I.—Mrs. G., a para-ii was admitted to the Jewish Hospital in the service of Dr. Polak on June 14, 1914. Her first baby was delivered by forceps in 1909. Later that year she had her appendix removed and in 1911 submitted to repair of the cervix and perineum and vaginal suspension of the uterus. On admission the cervix was found displaced upward and posteriorly and admitted one finger. How long labor had been in progress the record does not state. On opening the abdomen the uterus was found sinistra-verted and almost the entire development was in the left posterior cornua. The baby was in the left sacroposterior position obliquely placed.

Case II.—Mrs. C., a para-iv was admitted to the Jewish Hospital in the service of Dr. Humpstone July 24, 1914. Last previous labor occurred in 1906. In Jan., 1913 she had a curettage, amputation of cervix anterior colpoplasty, perineoplasty, and vaginal suspension of the uterus. On admission in labor examination revealed a moderately tight circular sphincter of the perineum, cervix high up and to the right, os evident only by a pin-point depression and in front of this a bulging of the anterior wall; no presenting part palpable. Child in transverse position. On opening the abdomen the uterus was found bound down in a mass of adhesions.

Case III.—Mrs. L., a para-xiv entered the hospital April 22, 1914 in the service of Dr. Humpstone. She had had eleven children and two miscarriages, placenta previa twice and prolapsed arm once. Last pregnancy in 1909. In July, 1910 she had an amputation of the cervix, perineoplasty and vaginal hysteropexy. Examination on admission revealed a fundus 38 cm. high, a moderately thin uterine wall which did not contract in normal manner, baby transverse, head to left, fetal heart to right at level of umbilicus, perineal floor firm, marked elongation of the posterior vaginal wall with the cervical opening above the level of the promontory. The anterior vaginal wall showed scar tissue of the operation and the thick anterior wall of the uterus bulging into the true pelvis from the posterior wall of the pubis to a point above the promontory. A moderate amount of bleeding. On opening the abdomen it was found that the uterus had partly torn loose from its fixation. Most of the development was in the bellied out posterior wall. Placenta was entirely situated over the os which was just above the promontory.

Case IV.—Mrs. G., a para-ix was admitted, in labor, June 13, 1909. Her previous eight labors were normal. In July, 1908 she had the usual gynecological operations including a Kelly suspension. After a long first stage with little dilatation and no engagement a section was done. The uterus was held down by a short band 1 inch long. Section was repeated in February, 1912 and again in October, 1914.

Case V.—Mrs. R., a para-v. Previous labors normal; the last in 1911. In May, 1914 she underwent operation, a combined Coffey plication and Olshausen suspension being performed. Last menstrual period March 7, 1916. At labor examination showed the uterus adherent to the abdominal scar with development of the pregnancy in the posterior wall and the fundus; cervix at the promontory, no dilatation, head in the anterior sacculation of the uterus. At section the uterus was found tensely adherent to the scar of the former operation just above the bladder.

Case VI.—Mrs. H., aged thirty-five, came to me August 29, 1916. She had an abortion in February, 1914 at the third month. Three months later she underwent a laparotomy for the removal of two small fibroids from the anterior wall of the uterus. This was complicated by an extensive infection of the wound lasting four months.

In February, 1915 she again aborted at about three and one-half months. When I saw her in August she was pregnant about five and one-half months. The lower abdomen from umbilicus to symphysis presented a scar of thin skin about 4 inches broad through which a thin uterus protruded. The vagina was relaxed and it and the vulva presented numerous varicose veins. Pressure against the anterior vaginal wall elicited extreme tenderness. Through the anterior vaginal wall a hard mass could be felt from the symphysis to the cervix (which was drawn upward and backward) which I concluded was the undeveloped anterior wall of the uterus. In order to avoid the dangers incident to labor I sent this patient to the hospital November 27, 1916, about two weeks before labor was due. At this time practically the entire uterus was herniated through the scar. With the patient on her back the fundus rested on the upper parts of the patient's thighs, and the posterior wall of the uterus was in contact with the anterior abdominal wall.

The abdomen was opened with an incision from 2 inches above to 4 inches below the umbilicus, the lower half entering the old scar. The gestation sac was limited to the posterior uterine wall and fundus, the anterior uterine wall having been prevented from participating in the pregnancy by dense adhesions. The fetus was in a position which would normally be a breech presentation, but under the existing conditions the breech was presenting toward the lower lumbar vertebræ and the head in the fundus overhanging the thighs. The uterus, which was not over one quarter of an inch in thickness, was opened over the fetal head, forceps applied to the head and the baby delivered. Three hours later the patient was having severe uterine contractions with the uterus distended and no lochia. On vaginal examination it was found that the cervix was still incarcerated above the promontory. The cervix was drawn down into the axis of the vagina after which she emptied her uterus and made an uneventful recovery.

766 Greene Avenue.

PYELITIS DURING PREGNANCY

BY

FRED. ELMER LEAVITT, M. D.,

St. Paul, Minn.

To speak of pyelitis as a disease peculiar to pregnancy is not wholly correct, because it creates the impression that the affection in some way is dependent upon pregnancy, an assumption that has little foundation of fact. And while it is true that pyelitis often attacks women who are pregnant, it cannot be said that the condition is the exciting cause of the pyelitis any more than it can be said of appendicitis, when that affection makes its appearance during gestation, that gestation is the cause of the appendicitis. It is more exact, therefore, to say "pyelitis *during* pregnancy" than to say "pyelitis *of* pregnancy."

The following characteristics of pyelitis are definite enough to give them place as fundamentals: The disease attacks the female more frequently than the male, some statistics showing a ratio as high as ten to one; primiparæ more often are afflicted with it than are multiparæ, the proportion being about three to one; it almost never occurs before the fifth month, and very exceptionally after the eighth; the affection greatly preponderates on the right side; and the microörganism responsible for the infection almost always is the colon bacillus.

While these facts are sufficiently well established to need no further proof, a little space may profitably be given to some of the theories which seek to explain them.

That pyelitis should attack the female oftener than the male is accounted for anatomically, the anus in the one sex lying so much nearer the urethral opening than in the other. That the disease more frequently develops in first than in subsequent pregnancies, is believed to be due to the greater intraabdominal pressure. Its right-sided proclivity may have some relation to dextrorotation of the uterus and the close proximity of the ascending colon to the kidney and ureter of that side; quite commonly, too, the right kidney is more movable than the left, and, consequently, less isolated.

A more important and, perhaps, the most disputed point concerning pyelitis is that of etiology. R. Franz, of Graz, a recent writer on the subject, maintains that an essential preliminary to the excitation of the disease is a blocking of the urine.

To what is this obstruction due? Stoeckel believes there is a physiological contracture in the ureter a few centimeters above the bladder opening, at a point where the duct crosses the linia terminalis; and, true it is that a distance of some 6 or 8 cm. from its vesical end an obstruction is met with which sometimes makes catheterization difficult. Yet no visible anatomical contraction has been observed by those who have had occasion in the course of an operation to expose the structure at this point. Franz, who has performed 400 operations for carcinoma of the uterus, asserts that he was never able to demonstrate any such variation. Anyway, there is no reason to believe that obstruction is peculiar to the right ureter.

As to rotation of the pregnant uterus being a cause of right-sided pyelitis, it is hard to believe that it has much influence. There are so many corners and angles for the ureter to creep into, and the uterus itself is so soft, that serious compression in this manner seems improbable. Zangemeister and Opitz suggest that mere increase in size may cause the gravid uterus, as it rises above the superior strait, to impinge upon the ureter and thus interfere with the free flow of urine. Such pressure may further act to arrest the peristaltic wave along the ureter. Likewise, general hyperemia of the genitalia may produce sufficient swelling of the mucous membrane to be another element. None of these, however, are more than possible factors in the causation of retention.

But the most disputed question in the etiology of pyelitis is, How does the infection reach the kidney? Do the germs that cause it get into the bladder from the outside and from there find their way to the kidney along the ureter; or are they conveyed to that organ through the blood stream; or, again, do they reach it along the lymphatic channels? While there are those who still hold that either of these routes may be traversed by the offending microörganism, the belief is growing that in most cases of pyelitis it is through the lymphatics alone that infection reaches the kidney, and that it rarely ever ascends along the urinary tract. That it is of hemogenic origin also may be questioned, especially if the infection be from the colon bacillus. Where pyelitis accompanies or follows upon another infection, such as an angina or a pneumonia, the germs may be carried to the kidney in the blood stream. But one then always finds in the affected organ the same germs that are responsible for the original focus. And the colon bacillus, it will be observed, seldom or never is found in the blood. The staphylococcus, so frequently found in the urine of gravidæ, is of such low virulence that it cannot be held responsible for trouble referable to the kidney. Furthermore, the urine undoubtedly has a bactericidal influence upon the growth of this organism that does not obtain with the colon bacillus.

In the light of recent observations it appears probable that the avenue by which infection reaches the renal pelvis is through the lymphatics which accompany the ureter; and that the neighboring gut is the source of this infection is quite probable. Bauerhausen and others have demonstrated by means of animal experimentation that germs can reach the kidney pelvis in this way, and Franke has shown anatomically the existence of communicating lymph channels between the ascending colon and the right kidney. That no such connection exists on the left side, throws further light on the right-sided peculiarity of the infection.

As predisposing causes of pyelitis, gestation itself brings with it increased intraabdominal pressure, pelvic congestion, and increased functional activity. The exciting causes, however, are said to be inactivity of the bowels, constipation, intestinal catarrh, and other irregularities so frequently in evidence during pregnancy. Kermauner has pointed out that pyelitis gravidarum may be only an exacerbation of a kidney inflammation that existed since childhood.

In confirmation of the belief that it is through the lymphatics that infection reaches the kidney, reference is made to a recent paper by Eisendrath and Schultz. After several years of animal experimentation, they agree with Bauerhausen and others that infection reaches the kidney by way of the lymphatics. Their experiments also go to prove the teaching of Franz that blocking of the ureter is necessary before renal infection from the bladder or lower ureter, either along the urinary tract or by way of the mural lymphatics, can take place. They have further shown that in the absence of such obstruction the infection can pass from the bladder to the kidney by means of the lymphatics alone. And while there is no positive proof that infection finds its way to the kidney through the anastomosing lymph channels which connect it with the intestinal tract and pelvic organs, there is good reason to believe that such a route is not only possible but that it is very probable.

First and foremost among the symptoms of pyelitis is fever. I have yet to see a case that did not have an initial temperature of more than 102 degrees; and, generally, it rises still higher, to 104 and even 105 degrees. Chills also are frequent. The fever is of the septic intermittent type, high in the evening and low in the morning, or high in the morning and low in the evening. There is comparatively little constitutional disturbance. Aside from a feeling of lassitude, the patient feels quite well. Next to fever, pain is the most constant symptom. Nor is pain always in the region of the affected kidney; it may be over the whole belly or deep in the pelvis. For this reason the symptom is confusing, often leading to the mistaken diagnosis of appendicitis and cholecystitis.

Almost as variable as the temperature, and having much to do with it, is the amount of pus discharged. One specimen of urine, for example, will show little or none, while another may contain a great deal. Such a recession of symptoms sometimes lead the patient and, perhaps, the physician, into thinking a cure is effected when only a lull in the disease has taken place. If at such times urine be examined that has been drawn from the pelvis of the kidney there always will be found in it the pyogenic germs responsible for the infection.

Other conditions to cause pus in the urine are stone and tuberculosis. The clinical signs accompanying these affections are, however, quite different from those of pyelitis. In the case of stone, colic is a marked symptom; in pyelitis colic is rare. With stone there is blood; with pyelitis there is none. Tuberculosis differs from pyelitis in that deep remissions of fever are not so common. To further distinguish stone from tuberculosis, the Röntgen rays would discover the former, while the latter could be proved by culture, animal experimentation, and the microscope.

The usual course of pyelitis is favorable. Under suitable management the temperature is reduced and may for a long time remain normal. Severe infection is rare, and the parenchyma of the kidney seldom involved. When the affection attacks the right kidney, the pain becomes very misleading, so much so that surgeons have been deceived into operating on the healthy appendix or on the normal gall-bladder.

The influence of the disease on pregnancy is that it frequently causes miscarriage. Statistics show that this occurs in about 40 per cent. of the cases, the other 60 per cent. going to term. Obstetric intervention is seldom necessary. Formerly it was advised that gestation be interrupted; but there is no need of this, since treatment can as effectively be applied during pregnancy as at other times.

In most cases it is sufficient if the woman be kept warm in bed, be allowed plenty of fluids, and given an urinary antiseptic. If this does not reduce the fever and relieve pain, the ureter of the affected side as high as the renal pelvis should be catheterized. It is remarkable how promptly the temperature drops when this is done. Very likely its rise and fall depends largely on an obstruction which catheterization quickly relieves. In severe cases one may leave the catheter in place. But this is not often necessary, and should never be continued for more than a few hours at a time. Posture also is said to favor drainage; and, with this in mind, it is suggested that the patient lie on the affected side or upon the abdomen so that the uterus may gravitate away from the ureter.

As to the urinary antiseptic that should be given, and the manner of administration, it is advised that urotropin be preceded by bicarbonate of soda in drachm doses t.i.d. for the first week. After this preliminary treatment, the hexamethylene-tetramin up to 30–70 grains a day, is given. Meanwhile the urine should be kept acid; and for this purpose, the acid sodium phosphate is the drug usually preferred. It is further recommended that this treatment be alternated weekly—bicarbonate of soda one week, urotropin the next.

If the above treatment does not bring relief, the next step would be to catheterize the ureter. Some urologists are much in favor of antiseptic instillations, but unless this can be done with great skill and exactness it better not be undertaken. While there are some excellent reports to be found in the literature in favor of this treatment, the results have, for the most part, been disappointing.

As germicidal agents, various preparations are used, notably silver nitrate in 1 per cent. strength. From two to four injections, given in the course of a week or ten days, is as far as this treatment should be carried. To pursue it further would be unwise.

Resort to surgery is rarely necessary and should be contemplated only when other measures fail. In case of fulminating hematogenous pyelonephritis of streptococcal or staphylococcal origin, if such a diagnosis can be made, nephrectomy may be justifiable. Even then, conservative treatment for twenty-four to thirty-six hours should first be tried. Surgery finds more application in those cases where the kidney has undergone irreparable damage from long-continued disease, the so-called surgical kidney.

How long may pyelitis continue? This is hard to answer for the reason that one never feels sure that cure has been permanent; an apparent recovery may have an exacerbation whenever the proper stimulus comes along. Where it has been possible to keep such patients under observation, bacterial urine from the affected kidney has persisted for months after an attack. Franz makes mention of a case where a patient had pyelitis in her first pregnancy, was cured, and later gave birth normally. Subsequent to this, bacteria was always to be found in the urine, although no subjective symptoms were complained of. She again became pregnant and again suffered from pyelitis. Evidently the affection has a marked tendency to chronicity; but it is believed that the destructive change in the renal pelvis occasioned by the colon bacillus, of which type most cases of pyelitis are, is, when properly treated, fully capable of spontaneous repair.

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910 Lowry Building.

A NEW METHOD OF TREATING PERNICIOUS VOMITING OF PREGNANCY.

BY

A. Y. P. GARNETT, M. D.,

Washington, D. C.

Hyperemesis gravidarum as defined by most authors is a condition of vomiting which has passed from the physiological to one of a pathological condition, leading to changes which, unrelieved, cause abortion or death.

It is difficult to recognize the time when vomiting of pregnancy passes from a normal condition to an abnormal one and only by means of chemical changes in blood and urine can we classify it as of a pernicious type.

There has been no satisfactory explanation for the physiological nausea of pregnancy though several theories have been advanced.

The suggestion advanced by Hirst of the cessation of absorption of corpus luteum as a cause and the success of the administration of the extract in certain cases is well worth further investigation.

Nausea occurs from one-third to one-half of normal pregnancies, usually a mild "morning sickness" appearing about the end of the first month and lasting for six to eight weeks. During this time there is apparently no known pathological change and we accept the condition as being normal on account of being unable to find a cause.

Most authors classify the cause of vomiting under four heads: 1. Reflex, from some abnormal condition of genitalia. 2. Due to some general abnormal condition of blood or abdomen. 3. Nervous excitability. 4. Toxemia.

The classification does very well, yet it only aids us in being more careful by examination in deciding if the case is due to a physiological or pathological condition.

Symptoms of the pernicious type usually begin in the second or third month and steadily increase until the patient shows marked condition of poisoning and toxemia, by the loss of weight, constant vomiting and changes in urine and blood.

The nausea and vomiting seem to be constant and not influenced by the food taken. The vomit at first is composed of undigested food and mucus, later mucus and bile, finally, bloody and of a coffee-ground appearance. The patient refuses to take any food by mouth on account of fear of increasing the condition. The urine at this time is diminished in amount, highly colored and usually contains albumen, bile, acetone and diacetic acid.

The changes in the urine are apparently due to toxemia, the nature of which has not been found and the vomiting cannot be attributed to the acidosis which seems to be a result and not the cause of the poisoning. The symptoms grow progressively worse until the patient reaches the stage of constant and uncontrollable vomiting and acute starvation.

The blood picture shows a secondary anemia, the pulse becoming thready and rapid, mental aberration and delirium frequently appear in the last stages and cases which reach these extremes usually die regardless of curettage or treatment of any sort.

The pathology of the condition shows signs of toxemia and poisoning chiefly effecting the liver and kidneys. Generally the change is of fatty degeneration with hemorrhages.

A case of vomiting of pregnancy should be carefully examined to ascertain if there is any reflex nervous or constitutional disorder present as a cause for the condition.

The urine, blood and alveolar air should be examined. If no changes in the examinations are found, the patient will work out her own condition, though certain medication in these cases has sometimes helped. Colon irrigation and regulation of easily digested diet in small amounts, often taken, sometimes help. Of the many drugs mentioned, few have any effect, though adrenalin chloride to increase the usually low blood pressure seems wise.

These cases, as a rule, take care of themselves in time and it is only when the alarming condition of emaciation, anemia, acidosis and rapid pulse develop, that necessary steps must be taken to stop the progress of the disease by some drastic measure. Curettage has been the last resort and usually postponed until the patient's condition has made her a poor operative risk, and it was with the idea of preparing the first case here reported for curetment that transfusion was performed.

The Abderhalden test was not done on the recipient and it would be most interesting to know if these cases of toxemia of pregnancy would show a negative one.

In both the cases a donor about ten days postpartum was selected as it was thought advantageous to have a donor who had recently passed through pregnancy, but in whom all uterine contractions had then ceased, in the hope that her blood might contain an antibody, antiferment or whatever it may be that would neutralize the toxic agent in the recipient, this neutralizing substance having been produced in the donor during her pregnancy at which time the toxic substance or substances had apparently been overcome or neutralized by her.

In a careful survey of the literature, I can find no report of a transfusion having been done on an antepartum case for pernicious vomiting and, while the article by Gettler and Lindemann appearing in the Journal A. M. A. of February 24, 1917, is most interesting, yet it differs from these cases here reported in that transfusion was done for the acidosis which is a result rather than a cause of the toxemia.

Losee and Van Slyke in the Bulletin of Lying-In Hospital, New York, January, 1917, also come to the conclusion that the nature of the toxin or toxins of the condition remain unknown.

CONCLUSIONS.

1. Pernicious vomiting is probably a development of physiological vomiting of pregnancy due to the failure of the patient to produce a ferment antagonistic to the toxemia of pregnancy.
2. Treatment in the true type of pernicious vomiting heretofore only palliative and unsatisfactory, and often delayed until patient is too exhausted to withstand curettage.
3. Changes in blood and urine and also autopsy findings point to a poisoning which would be important to recognize as soon as possible and interesting to study in conjunction with Abderhalden reaction.
4. The acidosis is not a cause but a result of the toxemia. The poison is not known.
5. Transfusion from postpartum cases here reported only treatment satisfactory and suggestive of unlimited possibilities if proved curative in this form of toxemia pregnancy.

CASE I.—Nina S., aged nineteen, single, colored. Admitted to Garfield Hospital on the obstetrical service December 2, 1916. Family history, negative.

Previous History.—Menstrual period regular, not painful and began at fourteen years.

Present Illness.—Last menstruation September 1, 1916. First noticed vomiting October 10th. Vomiting steadily grew worse until there had been continual vomiting to date of admission to hospital. Had been unable to retain food of any amount for the past eight weeks. Lost 25 pounds in weight; feels very weak and dizzy and had been confined in bed for the past two weeks. Bowels very constipated.

Examination.—Patient, anxious expression; very emaciated; weight sixty-nine pounds; conjunctivæ very pale; constant flow of saliva from mouth; heart negative; lungs negative. Temperature 99.8° F.; pulse 124; blood pressure 95 systolic, 60 diastolic.

Vaginal Examination.—Cervix soft; uterus size of three months' pregnancy, in midline position, freely movable. Abdomen, no mass felt, no rigidity or tenderness. Teeth fair condition; throat normal; nose, negative. All reflexes slightly exaggerated.

Blood.—Wassermann negative; white cells 7200; red cells 2,472,000; hemoglobin 75 per cent. Differential count: small lymphocytes, 14 per cent., large lymphocytes, 7 per cent., mononuclears, 17 per cent. Polynuclears, 58 per cent., eosinophiles, 2 per cent.

Urine Analysis.—Sugar negative; albumin, trace. No acetone or diacetic acid. Ammonia coefficient 9 per cent. Amount 250 c.c. in twenty-four hours. Occasional hyaline and granular cast.

Treatment.—Patient treated by nutrient enemas, colon irrigations, using 2 gallons of bicarbonate of soda solution, dram to a pint, every four hours. Also adrenalin chloride solution, ten drops, one to one thousand solution by mouth. She was allowed milk and Vichy occasionally during the day but was continually unable to retain any nourishment by mouth.

On December 14th the patient's condition had grown markedly worse and she was in a serious condition. She had lost weight, pulse running between 140 and 150. She was very weak and slightly delirious. Hemoglobin had dropped to 50 per cent. and blood was beginning to appear in the vomit. I decided to transfuse her for curettage. The Kempton-Brown tube was used, 250 c.c. of blood injected from a ten-day postpartum case which had previously shown a negative Wassermann and hemolysis and an agglutination test between recipient and donor negative. Within twenty-four hours patient's condition markedly improved. Temperature 98.4° F.; respiration 20, and pulse 80. Though saliva continued to dribble from patient's mouth, she was neither nauseated nor did she vomit. The nutrient enemas were kept up until the 19th, when she was allowed food by mouth which she retained for the first time in six weeks. She continued to improve steadily, gained 25 pounds in weight; hemoglobin went to 80 per cent.; red cells 3,500,000 and urine normal, when she was discharged from the hospital on February 9th. She has been in perfect health since, no nausea or vomiting, attending to her duties around the house and will return to the hospital at the termination of pregnancy.

CASE II.—Mrs. H. F., aged twenty-nine; married; white; seen in consultation with Dr. Jeffries on February 9, 1917.

Previous History.—First menstruated at fourteen and one-half years, periods irregular, scant flow, five-day type, painful. Fair health until sixteen, afterward suffered much pain at periods. Very nervous with frequent spells of extreme nervousness. Suffered pain in right side for about four years when she was operated on at twenty-four, and cystic ovary and appendix removed. Recovery good. Married at twenty-six and thinks she had a miscarriage after six weeks' pregnancy, as she had sudden pain and hemorrhage after exertion. Health very poor for about a year and one-half; improved, however, during the past year.

Present Illness.—Has not menstruated since the middle of November. First part of January began feeling nausea and loss of appetite throughout the day. About January 20th vomiting commenced, first early morning sickness, finally of a continuous type. After this period she has retained very little food. Vomiting has steadily increased up to February 9th.

Examination.—Patient very nervous, emaciated and weak; temperature 99.4; respiration 22; pulse 100. Conjunctivæ pale; throat and nose normal; heart and lungs negative; blood pressure 90 systolic, 70 diastolic.

Vaginal Examination.—Cervix soft; uterus well forward, freely movable in midline; size, three months' pregnancy.

Blood Examination.—Red cells 4,100,000; hemoglobin 75 per cent.; white cells 8200.

Urine Examination.—Acetone and diacetic acid present; faint trace of albumin.

Patient continued to vomit all nourishment and was removed to Garfield Hospital on February 12th. At this time, blood examination showed red cells 3,700,000; white cells 8000; hemoglobin 60 per cent.; polynuclears 76 per cent. Urine continued to show acetone and diacetic acid, urea 5 per cent.; ammonia coefficient 9 per cent.; no casts, total 24 hour amount 2100 c.c. Patient put on small amount of easily digested diet; adrenalin chloride 10 drops, one to 1000 solution every four hours. Corpus luteum had been tried previously, 30 grains, three times a day without any effect whatsoever. Colon irrigation 2 gallons, used bicarbonate of soda solution, dram to the pint, and last pint retained. Patient continued to vomit all nourishment; pulse gradually rose to 120 until, on February 20th, she had grown markedly weaker. On this day she had practically continuous vomiting, having had thirteen attacks. On February 19th, fourteen attacks of vomiting. She had grown much weaker, the pulse gradually increased, vomiting uncontrollable, so transfusion was decided upon. A ten-day postpartum case was procured as a donor and 250 c.c. of blood transfused by Kempton-Brown method. February 20th, following day, pulse had dropped to 100; she felt much stronger and vomited once. She had hiccoughs several times during the day but was relieved by taking something in her stomach. February 22d vomited three times, but only once after taking food and has retained all nourishment. Urine at this time shows slight trace of albumin, acetone and diacetic acid. 24th, acetone, albumen and diacetic acid still present in faint amount; vomited three times, once after eating, other two times only a small amount of green fluid. Remained up in a Morris chair two hours. 26th, steadily gained strength and urine showed no acetone, slight trace of diacetic acid and albumin. March 1st, has retained all nourishment for the past forty-eight hours and wishes to go home. March 2d, patient very hysterical and obstreperous and thoroughly unreasonable. Refused nourishment and treatment and worked herself into a very nervous condition. Vomited three times, small amount of greenish fluid. Following morning, March 3d, acetone and diacetic acid had reappeared; second transfusion of 200 c.c. blood done March 4th from a seven-day postpartum case. Since the second transfusion, the mental condition of the patient has improved, the acetone and diacetic acid disappeared; she has asked for and received food by mouth and retained all nourishment. She is to all appearances, on the road to recovery. (Patient returned home five days after second transfusion and has never had any nausea or vomiting since and has retained all nourishment.)

I wish to express my appreciation for the aid and assistance of Dr. H. H. Kerr who transfused both of these cases. Also Dr. Tilton for his interest and care in the first case.

THE WYOMING.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Meeting of April 5, 1917.

The President, FRANK C. HAMMOND, M. D., *in the Chair.*

DR. E. P. BAMARD and DR. C. B. REYNOLDS presented papers on the subject of

RETAINED ADHERENT PLACENTA.*

DISCUSSION.

DR. GEORGE M. BOYD.—I am in accord with the views of both speakers. We should emphasize the importance of waiting, particularly in the normal labor case, until we are sure that the placenta is separated before we aid by the use of the Credé method of compressing the uterus. The most important aid in diagnosing separation of the placenta is the position of the uterus. If we will follow the rule of

(* Original articles will appear in September issue).

waiting until the uterus has reached about the level of the umbilicus we shall in the majority of cases have secured separation. If the placenta does not then come away we may make a diagnosis of retained placenta and then carry out the Credé method to aid in the expulsion of the organ. In making the differential diagnosis between retained and adherent placenta I would hesitate to make an internal examination until half an hour or an hour had elapsed, particularly in the absence of excessive bleeding. If bleeding is profuse we are compelled to verify the diagnosis. We can then readily make the diagnosis by the location of the placenta. If it is within the cavity of the uterus and the patient bleeding, the placenta is probably adherent. In the majority of cases of retained placenta internal examination will show that almost the whole of the organ is within the vaginal cavity. After the diagnosis of adherent placenta is made we should immediately separate it, and I should carry out the line of treatment indicated by Dr. Reynolds.

Dr. Stricker Coles.—Traction on the cord should never be made until we are sure that the placenta is separated and in the vault of the vagina; otherwise, we are likely to have inversion of the uterus. My experience has taught me to be certain that the uterus is empty. I would not hesitate if I were in doubt, to explore the uterus and see whether or not the placenta were retained. I have never had any trouble in this respect in my own practice but I have seen a good deal of trouble in the cases with other physicians. A couple of years ago I saw a patient who had given birth to three boys. A large piece of placenta was left for one week. It was adherent and the woman septic. Quite a little force was necessary to separate the placenta which was quite as large as the hand. The temperature was 104 and the pulse 150. The placenta was adherent and the womon was bleeding. In that case forcible separation of the placenta was necessary, as we could not leave it because of the hemorrhage. The patient died of sepsis about a week later.

Dr. Richard C. Norris.—The whole question of retained and adherent placenta may be summed up in a proper knowledge of the mechanism and management of the third stage of labor. In my experience of twenty-three years at the Preston Retreat and in private practice I do not recall a single case in which I have had to introduce the hand into the uterus to remove the placenta. I have had some assistants during that time who have introduced the hand into the uterus to remove what they thought were partially adherent placentæ. I recall two or three such cases which gave me much trouble afterward from infection. It used to be said, and doubtless with truth in the preantiseptic days, that there was no operation in obstetrics more dangerous than the introduction of the hand into the uterus to remove the placenta. I can conceive of the possibility of the sterilized rubber-gloved hand being introduced into the uterus with less danger than the hand could be introduced in the older days. We repeatedly introduce the rubber-gloved hand in Cesarean section without thought of danger. The rubber-gloved hand entering the uterine cavity through the probably contaminated vulva and vagina is another problem. I take it for granted that men in this society know the mechanism of the separation of the placenta and the dangers of meddling in this stage. The double ligature to the cord has an indirect bearing upon this question, aiding as it does the formation of the retroplacental clot to assist placental separation.

The diagnosis between retained and adherent placenta, I think, is a very simple matter. The uterus after labor contracts and retracts. Contraction means the hard globular mass that we feel through the abdominal wall to be followed later by retraction, during which the uterus rises in the abdomen, not so tensely contracted, yet firm and rising up toward the umbilicus. It is a simple matter to note whether the cord recedes with the placenta still attached to the uterine wall, during this stage of retraction. If this phenomenon is present we know that the placenta has not separated, that it is still adherent. When we find that there is delay in delivery of the retained placenta the mechanism and the knowledge of the contraction ring come into play. I have never once found in the third stage of labor a firmly contracted external os. I have found at times, when I thought the external os was contracted on the placenta, that it was dilated and that the constriction was at the so-called contraction ring. I never have believed that ergot after labor would produce contraction of the cervix. The cervix is part of the lower uterine segment. It has been overstretched, more or less paralyzed, and will not respond to ergot during the brief period of the third stage of labor. The firm contraction of the upper segment of the uterus has separated the placenta and it is gripped at the contraction ring like an hour-glass contraction. I introduce the fingers, follow the cord through the vagina, and entering the external os part of the placenta may be felt in the lower uterine segment. One can dig the fingers into the placenta in the lower uterine segment. Gentle traction will overcome the contraction and remove the retained placenta. I never wait more than twenty minutes for a retained placenta. In a placenta which has been separated the margin of which you can feel at the contraction ring there is no advantage in waiting. The Credé operation practised at this time is highly advantageous. The management of a partially adherent placenta accompanied by serious bleeding is a different story. That means that you cannot feel at the external os, in the lower segment, a portion of the placenta; cannot feel the attachment of the cord to the placenta at this area. The Credé method under such circumstances at any time after delivery of the child may be indicated. After separation, the placenta will be found at the margin of the contraction ring and can be removed without introduction of the hand. While these may be regarded as theoretical considerations they are substantiated by my personal experience. Not once in twenty-three years have I had my hand pass the margin of the contraction ring to remove a partially detached or a retained placenta. I take it then, that a knowledge of the mechanism of the third stage of labor and of its proper management enables us to successfully handle these cases. I believe it pernicious practice to resort to the Credé manipulation before it is indicated. It is likewise a pernicious habit to introduce the hand into the uterine cavity when it is unnecessary.

Dr. Daniel Longaker.—I am in entire accord with the last speaker and in my own experience over an even longer time, it has been extremely rare that introduction of the hand in the uterus has been necessary. It undoubtedly causes morbidity. Tweedy a past master of the Rotunda has written a book in which the treatment of the third stage of labor is most completely outlined and in which the pernicious results of manual removal of the placenta are emphasized—as they should be.

Dr. Philip F. Williams.—I have often been impressed in the work among students in the Southeastern Dispensary regarding their lack of knowledge of the third stage of labor. The students do a Credé quite often immediately after the child is born. The frequent use of ergot and pituitrin increases the spastic condition of the contraction ring, and I have often when called told them to let the woman absolutely alone. By the time I reached the dispensary it was a very simple matter to squeeze the placenta out. I had something like 400 cases in my service at the New York Lying-In Hospital in a period of four months as house surgeon. In but one instance was there manual extraction of the placenta. The child had been delivered eight hours before extraction was attempted. Credé had been done repeatedly without success. In that instance the placenta which was firmly adherent was not entirely removed by the manual method and ten days later instrumental exploration of the uterus revealed a piece of placenta tissue in one cornu of the uterus.

Dr. J. O. Arnold.—My observations on this subject have led me to believe that probably two-thirds of the men doing obstetric work forget that the expulsion of the afterbirth is a part of the normal function of the uterus—that it constitutes the third stage of labor—the uterus is still in labor, and if it is normal labor, it should be permitted to finish its work in normal manner.

The fear of postpartum hemorrhage, and the desire to get away as soon as possible after the child is born, as well as a good deal of faulty teaching along this line, have led to the almost universal custom, in this country of grasping the uterus and beginning manipulations at once without giving a chance for the normal mechanism to detach the placenta. This seems to be what everybody has been taught to do, for wherever I go I have difficulty in getting the nurses and internes to let the uterus alone until it has had time to rest and react from its final efforts in expelling the child, and the general practitioner almost invariably refuses to wait. I recall an incident illustrating this meddlesome interference some time ago. I was assisting a very well known doctor not far from Philadelphia—a man of many years of successful obstetric experience. At the conclusion of the delivery I remarked that we could sit down and wait awhile now, till the uterus got ready to expel the placenta. His reply was "oh go ahead, I never wait. If the placenta does not come away at once I always go in after it." Here was a man who apparently never hesitated to enter the uterus on the slightest indication, and yet I suppose his obstetric mortality for all these years has been very small. In some of the foreign maternities where they give a much longer time to the third stage of labor than we do here in America, postpartum hemorrhages and retained placentas seem to be of very rare occurrence. In one of the Vienna clinics where I spent some time, no attempt was made to hold the uterus or to express the placenta at all. The patient was placed in a comfortable position in the bed and let alone for some time. The placenta was usually expelled spontaneously or with but little help, and postpartum hemorrhage was practically unknown. In this clinic they claimed that there is really but one variety of true adherent placenta, and that is placenta accreta which is extremely rare. Up to the time of my visit in 1913, Frankl the Schauta pathologist, had seen but three cases in his years of experience in this great clinic, and these all ended fatally. The only successful treatment, according to Frankl, that had at that time been reported, was the immediate use of the Momberg belt with hysterectomy as quickly as possible. I had the opportunity of seeing the uteri from two of these cases, and could easily understand from the intimate blending of the placenta and uterine wall, the utter futility of any attempt at manual removal in such cases.

The practical point, it seems to me, is that emphasized by Dr. Norris—knowledge of the mechanism and proper conduct of the third stage of labor.

Dr. Charles S. Barnes.—I have not introduced the hand into the uterus for many years until recently. This was a case in which the hospital resident called me in the night saying that it was a case of retained placenta. After repeated attempts with the Credé method I was compelled to introduce my hand into the uterus and only with great difficulty could I separate the placenta; in fact, I do not think I did get it all away. There was some infection but the patient finally recovered. There is one question upon which I should like the opinion of the Society. In speaking recently to a nurse of the necessity of guarding the uterus following delivery of the child and of avoiding too early stimulation or compression, there was in the case under treatment at the time so much bleeding that I was obliged, because of partial placental separation to do just what I had advised against. Then after delivery of the placenta I gave a hypodermic of ergot. The nurse asked whether I gave ergot before the emptying of the uterus. I said no, that most authorities advised against it. She said with reference to one of the best known maternity hospitals in the city that ergot was routinely given immediately after the child was born and before delivery of the placenta. A representative of the staff of that hospital is here and I should be glad to know the custom. The inquiry is made to obtain information and not by way of criticism.

Dr. Edward A. Schumann.—I feel that the Credé method as ordinarily practised is pernicious, unsurgical and greatly traumatizes the uterus. I believe that in the event of retained placenta, as Dr. Norris has said, it is rarely necessary to do more than manually lift it out of the vaginal canal. I believe that in hospital practice it is entirely proper to leave the placenta *in situ* for twenty-four hours if it does not separate before. Furthermore in true adherent placenta, which I believe is extremely rare, attempts at manual delivery are entirely improper and result in enormous mortality. I would leave such a placenta in place until I was sure of the diagnosis. I would then do a laparotomy, open the uterus and if possible remove the placenta through the incision; otherwise, do a hysterectomy. The mortality of true adherent placenta is very great. I do not believe the cause is endometritis or gonorrhea. These diseases are so frequent as to be practically universal, and yet true adherent placenta is extremely rare. I have seen slides from a specimen which led to a thought which is very suggestive regarding etiology. I am convinced that these cases are associated with adenomyoma developing in the uterus and form a placenta accreta, by reason of the villi dipping into the aberrant glandular tissue forming the adenomyoma.

Dr. Philip F. Williams.—I would like to ask Dr. Schumann if he feels that he can remove adherent placenta more easily by transperitoneal hysterotomy than by manual extraction through the vagina?

Dr. Schumann, replying to Dr. Williams.—I do not believe that truly adherent placenta can ever be successfully removed from below. I do not believe that true adherent placenta exists except in the form of placenta accreta.

Dr. Reynolds, closing.—I have only to add that if we make a diagnosis of adherent placenta it is our custom to do a manual detachment only when the patient is in a serious condition from hemorrhage. Hemorrhage is our guide in this matter. Two cases are recorded in which we used pressure for three hours before the placenta was detached. We did not insert the hand into the uterine cavity. I have not personally seen a case in which the placenta and membranes were completely adherent. Polak reports one case of complete adhesion of the placenta in which attempts at delivery had been made, and as this patient was infected and had fever when she entered the hospital a hysterectomy was performed. We all know that introducing the hand into the uterus is a very dangerous procedure but I believe that if these patients are properly prepared for labor and that if we keep our hands off during the second stage; and as Dr. Norris has said, have a knowledge of the mechanism and management of the third stage of labor the mortality will be much lower.

Dr. George Erety Shoemaker presented a paper on

INVERSION OF THE UTERUS OPERATED BY THE SPINELLI METHOD.*

Dr. Barton Cooke Hirst.—I have had eight cases of inverted uterus. I have done the Spinelli operation three times in chronic cases and in five cases I reinverted the uterus by taxis, once as late as the fifth day. This, I think, is what Dr. Shoemaker ought to have done; and what probably would have been done had the patient been sent to the Obstetric Department of the Presbyterian Hospital. I can see no reason for any woman to go as long as this woman did unrelieved. She could probably have been spared the operation by having the uterus reinverted a few minutes after the occcurence of the inversion. Shock is not a contraindication to the attempt and if her endometrium is infected it does not make much difference if it is turned out or in. The Spinelli operation is a good operation, but one point to be emphasized is that the cervix ought to be split first without opening the peritoneal cavity; this may suffice. The great disadvantage of the operation to the woman is the extensive scar. This is very different from the Cesarean section scar which is under no strain until the woman reaches the full time of pregnancy. The scar of the Spinelli operation, however, involving the whole length of the uterus will endanger her existence from almost the moment she becomes pregnant, or will cause an early miscarriage. I think, therefore, we ought to be careful not to subject a patient to unnecessary risk by operating in inversion of the uterus when it can be reduced by taxis just as well as not.

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* For original article see page 268.

Dr. George M. Boyd.—I was about to ask the same question which Dr. Hirst asked. I take it that the woman's general condition was the reason for not repositing the uterus when the case was acute. The case brings to mind one of complete inversion seen some time ago. After failing by taxis to reduce the inversion, I opened the abdomen and by making pressure from within relieved the point of constriction and in that way re-turned the uterus. That patient thus escaped an incision of the uterus and the danger from the scar in subsequent pregnancy and labor.

Dr. Philip F. Williams.—I should like to ask Dr. Hirst whether any of the three patients on whom he did the Spinelli operation became pregnant and if so, what was the course of the pregnancy and how did it terminate?

Dr. George Erety Shoemaker.—The physician who sees a patient has the best opportunity to know what is best to be done. This woman was nearly dead from hemorrhage, not from shock, when first seen. Some hours later reasonable effort failed to get the inverted fundus through the tightly contracted cervix. Anyone who did more than was done would have killed her. It was interesting to see as the active decomposition of discharges and exfoliation of inverted endometrium proceeded later on that the inverted position apparently acted as some protection. Ill as the woman was a similar amount of local infection has appeared to the writer to have more profound effects. More than once there occurred to mind the analogy with the safe behavior of necrotic intestine which has been allowed to protrude through an abdominal opening for drainage without being cut away; also how after the clamp operation for vaginal hysterectomy necrotic tissue will lie safely in the vagina. I cannot agree that a foul septic inverted uterus is just as safely put right side out; though anyone would reduce a clean inverted uterus if possible. Inversion of the uterus is an entirely preventable accident. If it occurs frequently it is a commentary on rapid and objectionable methods in obstetrical practice.

DR. EMERY MARVEL presented a paper on

HYSTERECTOMY: THE OPERATION OF CHOICE TO TERMINATE PREGNANCY.*

DR. RICHARD C. NORRIS.—I have been much interested and almost persuaded to think that if I were a woman I would be better off without my uterus under all conditions of life. It may be an irksome care to a woman to have a uterus, but it is to her advantage. I think that is an axiom that we cannot ignore. I cannot subscribe to the doctrine that removal of the uterus is necessary for some complications arising in pregnancy which in that same woman might not arise again. As Dr. Marvel read his paper, there passed through my mind the thought of some cases of toxemia I have seen in pregnancy, and of some thirty or forty children in the world to-day who would not have been here had I removed those women's uteri. Even the aggravated types of vomiting are not bound to recur in every case. We have some cases of pernicious vomiting of pregnancy in which we find it necessary to perform an abortion, but in which a subsequent pregnancy is not accompanied by the attacks. The disadvantages of the loss of blood from the menstrual period from the standpoint of tuberculosis is not, to my mind, to be put in the balance with the loss of ovaries and uterus. If the ductless glands are of value in life the ovaries must be of value to the life of the tuberculous woman in retaining the equilibrium of her nervous system and perhaps her body chemistry. There are methods of producing sterility not attended with the same mortality, morbidity, risk and shock as removal of the uterus. My feeling is that, not for a moment, would I subscribe to the necessity or even the desirability of doing a hysterectomy in obstetric practice to meet conditions that less aggressive methods have been found to meet satisfactorily.

DR. BARTON COOKE HIRST.—The intrusion of the general surgeon in obstetrics is one of the most amusing phenomena in modern medicine. We have Deaver doing hysterotomy for all obstetric complications without special experience or training in obstetrics, and here is my friend Marvel with a predilection for hysterectomy. Those of us who have to deal with these conditions constantly and in large numbers of cases would not accept his proposition for a moment. We have better methods of preventing conception than taking out the womb. To sterilize a woman or even to precipitate the menopause is a serious matter demanding careful consideration. Some of the patients described by Dr. Marvel might have had other children subsequently without detriment to their health.

It is curious how submissive women are to doctors. I am often amazed in asking a woman about her previous surgical experience to be told that she had gone to a certain hospital, had an abdominal operation done, without the least idea what was done or what it was done for. We had better look to ourselves. In the coming emancipation of women we may exchange natures with them. Imagine, if you please, a society like this composed of women who were dealing, say, with genitourinary affections, and who decided in a congress that if they ever caught a man with gonorrhea they would make a eunuch of him so that he could not get it again.

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*For original article see page 271.

Dr. E. A. Schumann.—It seems to me that this discussion has not been exactly fair. I believe that Dr. Marvel meant to say that the cases in which he prefers hysterectomy to any other means of terminating pregnancy and producing sterility are those in which we would all practice sterilization. I know that Dr. Hirst and Dr. Norris agree that sterilization is an important and proper procedure under certain conditions. I think the one weak point in the paper lies in the suggestion of sterilization in a patient in a more or less precarious condition who is to be subjected to an unusual strain or operation. Should it become necessary to sterilize such a patient an operation should be done in two stages. Were this to be done I am of the opinion that a supravaginal hysterectomy leaving the ovaries behind would best meet the indications. I do not agree with Dr. Marvel in his indications for sterilization. It seems to me it would be most unusual but I believe it is a reasonable proposition and of advantage in the type of cases I have mentioned.

Dr. Stricker Coles.—There are some cases, very few, in which I have given the opinion that the woman who had incipient tuberculosis had better have the uterus emptied. Twice women who were Catholics said no. These women had two children since I thought abortion justifiable. In both cases my opinion was wrong. Both mothers and children are living.

Dr. Daniel Longaker.—In the Kensington Hospital for Women we have had a large number of cases of toxemia of pregnancy of the severe type, as many as five cases in the past ten days. All recovered but one, and I believe, basing my opinion upon our past experience, that the majority of these patients will go through subsequent pregnancies without any trouble at all. Therefore, the proposition to sterilize the eclamptic is not timely.

Dr. John A. McGlinn.—There is no question at all but that the operation which Dr. Marvel proposes would meet all the indications. I cannot, however, subscribe to the indications which he has set forth. As the other gentlemen have said it is not unusual to have a woman go through a second pregnancy without the trying conditions of the first. I have had a number of patients with the most pernicious type of nausea and vomiting leading on to eclampsia yet who went through a subsequent pregnancy without any sign of eclampsia. I have a case in which I am most deeply interested in which the first pregnancy was toxic, but the child was born; in another pregnancy the patient was again very toxic necessitating emptying the uterus. Since then there have been two pregnancies with delivery of living children without difficulty. These children are very dear to the parents and I would not like to think of this patient having been subjected to a hysterectomy and these children not born. Again in tuberculosis, I do not think we can predicate from the condition of a tuberculous patient in one pregnancy what the condition may be in a second. If the expert in tuberculosis watches the case with the obstetrician the case may progress without any lighting up of the tubercular infection. I do not believe hysterectomy is as safe an operation as some of the other measures of sterilization. Although in supravaginal hysterectomy you may run a long series of cases without mortality there will be ultimately a certain definite percentage of deaths. Although hysterectomy will accomplish the results mentioned by Dr. Marvel, from the obstetric standpoint it is hardly the operation of choice.

DR. JOHN A. McGLINN.—I may have been mistaken in my understanding of Dr. Marvel's statements, but so far as hysterectomy was concerned, I think he claimed that this operation could be done with less blood loss and with less mortality than could instrumental dilatation of the uterus.

DR. MARVEL, closing.—I realize that it required much temerity to come to Philadelphia and present this subject to the Obstetrical Society, but no less are my convictions in the merits involved in the recommendation. Hysterectomy under the circumstances is the simplest operation that can be done. There is complete control of the bleeding and the removal of the uterus without removing the ovaries does not impair the secretory influence of the glands. In the three cases in which I have done the operation I feel that the best judgment was exercised. The title of the paper required some change to be true to its discussion and I thank Dr. Schumann for his suggestion in this change, which I will welcome, and ask permission of the Society to change accordingly. If we are to be the guide for our patients we must not permit a woman's life to be too greatly jeopardized by repeated and probable fatal subsequent hazard; especially when it is possible for her to have protection against such jeopardy.

DR. G. E. PFAHLER and DR. JOHN A. McGLINN presented a paper on

RÖNTGENOTHERAPY SUCCESSFUL IN UTERINE FIBROID WITHOUT AFFECTING THE OVARIES. REPORT OF A CASE AND SPECIAL TECHNIC.*

DR. RICHARD C. NORRIS.—I should like to ask Dr. McGlinn what time elapsed between the termination of the pregnancy and the beginning and ending of the *x*-ray treatment? It seems to me that every phase of this particular case has been considered except the regenerating changes following pregnancy that cause fibroids to disappear or bring about very marked reduction in size.

DR. JOHN A. McGLINN, closing.—Replying to Dr. Norris, the patient was delivered May 19, 1915, and was seen in September, four months later. At that time there was practically no reduction in the size of the tumor but the uterus was well involuted. The cornua of the uterus which had not been subjected to the *x*-rays was greatly enlarged.

*For original article see page 262.

TRANSACTIONS OF THE SOCIETY OF THE ALUMNI OF THE SLOANE HOSPITAL FOR WOMEN.

Meeting of January 26, 1917.

The President, DR. JOHN DOUGLAS, *in the Chair.*

DR. GEORGE W. KOSMAK presented a report of a case of

DYSTOCIA DUE TO SHORT CORD.

"The patient, Mrs. H. H., aged thirty-one, a para-iv had been under my immediate observation during her present pregnancy, which was figured out to be complete on or about January 28, 1917. Aside from occasional nausea and vomiting the patient had been in good general condition. On the evening of December 17th last, without any apparent cause the membranes suddenly ruptured. I saw the patient soon afterward and found no evidences of labor pains. An examination showed a very soft cervix about three fingers dilated, thinned out, with the head presenting at the brim. The patient was transferred to the Lying-In Hospital and as the liquor amnii had drained away freely another examination was made to determine the future course to be pursued. The patient had been having a few weak pains and as the cervix was almost four fingers dilated she was given a dose of quinine and strychnine. The fundus was also massaged at regular intervals by the nurse and the pains became stronger and more regular. An examination at 8.00 o'clock the next morning showed the head well through the brim but little advance took place with the pains. A free discharge of dark blood was noted at the time of each uterine contraction. The patient was then taken to the operating room and prepared for delivery. The bleeding became more marked and the head receded with each pain. The fetal heart also became somewhat irregular. A diagnosis of short cord and possible separation of the placenta was made and an immediate forceps extraction was done under light chloroform anesthesia. Considerable difficulty was experienced in extracting the head and as it came through the outlet the cord was found to be tightly wound around the neck, the edge of the placenta appearing as the trunk was being delivered. The baby breathed immediately and seemed perfectly normal in every respect except that it was premature, weighing 2000 grams. The placenta was then pulled out of the cervix and vagina. The cord was inserted at the extreme edge in an attenuated manner and measured 43 cm., from the edge of the placenta to the umbilicus. The patient bled moderately after delivery but this was controlled with ergot.

"An interesting feature of this case is to be found in the previous labor. I also had the patient under my care during this pregnancy. She went along in fairly normal manner until the eighth month. At this time she was in the country and began to complain of a feeling of pressure in the region of the bladder early on the morning of May 26, 1914. About noon a sudden gush of blood occurred and a local physician was called who made an examination and concluded that a placenta previa was present. When I arrived at the house the patient was in extreme shock with evidences of internal hemorrhage. There was a steady trickle of blood from the vagina and the bed and surroundings were more or less saturated. The patient was quickly prepared and an examination showed the cervix about three fingers dilated, moderately firm, membranes unruptured, head at the brim but no signs of a placenta. A diagnosis of accidental hemorrhage due to separation of a normally situated placenta was made and under light chloroform anesthesia the cervix was manually dilated, the membranes ruptured and a complete podalic version done. The baby was moderately asphyxiated but readily resuscitated. The placenta came away with the child and about two-thirds of the maternal surface was covered with a dense black clot. The patient made a slow but uneventful recovery. The baby was premature but survived.

"After this labor the patient continued to bleed irregularly for several months until a curettage was done the following October. An examination of the scrapings showed no evidences of malignancy and there was no further bleeding.

"In the first two pregnancies there is no history of a similar occurrence; both children survived although the labor was very difficult in the first. It seems curious that a placenta and cord anomaly should exist in two successive pregnancies. Whether a chronic pathological condition of the lining uterine mucosa is responsible for the malposition of the placenta and the cord anomalies is a question that cannot be readily decided."

DISCUSSION.

DR. G. L. BRODHEAD. "I do not know whether the members of the Society will remember it, but as far back as 1899 one of the first Presidents of this Society, Dr. Samuel M. Brickner, wrote a paper on dystocia due to short cord which was published in the *American Journal of Medical Sciences* in November, 1899, bringing out a new symptom in this condition. The main points which he brought out in the order of their importance on the subject of short cord, were these: First, recession of the head in the interval of pains; second, arterial bleeding during and between uterine contractions; third, urination in small quantities in the intervals of pains after the establishment of the second stage; fourth, pain over the placental site; fifth, the desire of the patient to sit up; sixth, uterine inertia. In this paper Dr. Brickner stated that the average cord would break under a strain of about 8 pounds, and might rupture under the influence of a falling weight of between 5 and 6 pounds.

"I would like to ask Dr. Kosmak if he noticed this particular sign that Dr. Brickner thought was a new symptom, namely, urination in small quantities in the intervals of the pains after the establishment of the second stage. As I understand it, the cord in this case was 43 cm. long. Could not your case have been one simply of accidental hemorrhage? Was it a relatively or absolutely short cord?" (Dr. Kosmak stated that it was a relatively short cord and around the neck, and that the symptom of urination beginning in the second stage, which Dr. Brickner called attention to, was not present in his case. The placenta came into view with the trunk and was probably separated during the process of forceps extraction.)

Dr. Henry P. De Forest read a paper on

CONTAGIOUS ABORTION AS A COMPLICATION OF PREGNANCY.*

Dr. Charles Edward Ziegler of Pittsburgh, the guest of the evening, read a paper entitled

THE ELIZABETH STEEL MAGEE HOSPITAL, A PRESENTATION OF ITS ACTIVITIES AS A MODERN HOSPITAL FOR WOMEN.†

DISCUSSION.

Dr. G. W. Kosmak, in opening the discussion, said: "The Society is greatly indebted and more than indebted to Dr. Ziegler for taking this long trip from Pittsburgh and explaining to us the ideals upon which the Magee Hospital is founded. I think that any ordinary practitioner of medicine, or specialist, for that matter, who listens to the ideals that have been expressed here to-night by Dr. Ziegler will at first thought regard these expressions as rather revolutionary in character, but we are living in an age in which revolutionary movements occur. They occur in medicine as well as in other things and I believe that, one and all, we must change our point of view and regard institutions of this kind as forming the foundation stones of our newer medical knowledge of the present day. I think that the ideas that we have had regarding medical colleges in general have been very much changed in the past decade or two and the building of such institutions as the Magee Hospital of Pittsburgh, undoubtedly will do a great deal to further convert us from the old ideas that we have had about medical schools.

"In addition to the numerous features which Dr. Ziegler called attention to and which are more or less revolutionary in character, there is another influence that a school and hospital of this kind has that Dr. Ziegler has failed to mention (I suppose there are so many things to say and so many things which he did say that it slipped by him) and that is the question of a substitute agency for the midwife. Now, we have agitated considerably in the last decade as to what we should do with the midwife and various plans have been proposed to educate the midwife, to supervise her and to arrange by means of proper schools for a supply of midwives for what we call the poorer classes of the community. If we can develop institutions of this kind, if we can have institutions that will educate the public mind to a proper understanding of what obstetrics means, I think the public will before long rise to the occasion and provide us with means with which to do away with the midwife entirely. Perhaps in the past the midwife has been a necessary evil, but if obstetrics continues that the midwife can soon be relegated into the limbo of forgotten to develop as it is developing at the present time, I think things. She may have been a necessary evil at one time. I think that to-day we should no longer regard her as a necessary evil, but, as one professor of obstetrics expressed it on numerous occasions, as a 'damn nuisance,' and undoubtedly institutions of this kind and the developing of the teaching force, the developing of a higher obstetric ideal and then the educating of the poorer classes will soon lead to the abolition of the midwife problem as such.

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* For original article see page 221.

† For original article see page 255.

"I have had the pleasure of visiting the Magee Hospital on two occasions. The first time was while the hospital was in the course of construction and the second was a year or so later, and I was astonished (and I think every one of you would be who went through that building) with the refinement of work which had been undertaken in that establishment.

"There is one thing that Dr. Ziegler did not touch upon particularly, and I hope in closing the discussion he will speak more on that feature, and that is the out-patient system. I was particularly impressed with that system. As far as I know we haven't anything like it in New York. They are developing that system to take care of the poor women in their homes who are unable to go to the hospital because of the presence of several children in the family who cannot be left alone at home and on whom the presence of the mother undoubtedly acts as a restraining influence. Pittsburgh is a big place and it is scattered over a considerable area of ground. It is practically impossible for these women to be under proper observation if the hospital which Dr. Ziegler has described here to-night were the only place to which they could go. In other words, like a circulating library, it must be brought near its clientele, and, very wisely, they have provided outside of the institution for substations all over Pittsburgh which are under the direct control of the hospital and in the immediate neighborhood of the sections from which the clientele of the hospital is drawn. It permits of the women going to some place near their homes where they can be examined and get advice and where urinalyses may be done. I think that is one of the very important features of the work of the Magee Hospital.

"In closing I want to say again that the Society should be very grateful to Dr. Ziegler for coming here and I feel that we owe him a debt of gratitude for the trouble he has taken and he ought to be personally commended for the consistent stand that he has taken in the matter of the development of this institution. As far as I can see, there have been no backward steps; the policy inaugurated in the beginning has gone steadily forward, and I think that in another decade from now this hospital will stand as a model for, I hope, other institutions that are to be erected in different portions of this country."

Dr. Asa B. Davis, in discussion, said: "May I express to the Sloane Alumni my appreciation of this opportunity to be present and share in this most interesting descriptive and illustrated explanation of the history, construction, workings and aims of the Elizabeth Steel Magee Hospital of Pittsburgh.

"I desire to commend, as heartily as it is possible for me, the work which a generous donor, Dr. Ziegler, and a broad-minded Board of Governors have undertaken, and thus far have so successfully accomplished. This institution now represents an ideal in material form.

"The justifiable and oft-repeated cry from all parts of our country arises, 'Obstetric teaching has not kept pace with the other branches of surgery and medicine. Inadequate hospital room, inadequate financial support and teaching equipment.'

"In this institution we find acres of park-like grounds, new, carefully planned, up to date buildings, constructed after a careful study of the best hospitals here and abroad and consultation with leading teachers and a plan best suited to this work and location has been evolved and materialized, avoiding the mistakes and retaining the good points to be found in somewhat older buildings devoted to this work in other cities. Provision for extension of the plant, ample means for its construction and equipment, and what was at the time generous and assured means for its maintainance, (no one is wise enough to say what are now or what will be in the near future ample means to maintain a hospital), conveniently located in a populous city.

"The medical director is professor of obstetrics in the nearby university. He is provided with a comfortable residence in the hospital grounds and given a salary sufficient for the maintenance of himself and family, aided by a well-trained full-time resident staff, whose members serve for long periods, and then go out as expert teachers and practitioners of obstetrics in that or other communities. He is supported by a generous, broadminded and progressive board of governors. His whole time is free to be devoted to the care and comfort of his patients, the teaching of obstetrics, consultations and to work, with clinical material and laboratory assistance, upon many of the, as yet, unsolved problems of obstetrics—along a unified plan. Desirable as it might be, from the viewpoint of the outside practitioner to have access to this hospital for the treatment of his patients there under his own supervision, as has been suggested, I believe that such a plan would largely nullify the possibility of advance and bring its care of patients and the teaching down to a mediocre level. I wish to congratulate Dr. Ziegler. I believe he is the right man in the right place, with a plant and plan for the care of patients and obstetric and gynecological teaching, for here both subjects are relative and closely allied, which is not surpassed in this country.

Dr. G. L. Brodhead said: "I confess myself to be lost in admiration and envy of this beautiful institution which Dr. Ziegler has told us about. I think the ideals which Dr. Ziegler has told us about are wonderfully high, and under his direction and with the means at his command, I feel sure that his institution will rank as one of the very foremost institutions of its kind in this country. It will, furthermore, be the means of teaching and educating many obstetricians to go out from there and do wonderful work. Dr. Ziegler is, of course, fortunate in having plenty of money at his disposal. There are a good many things we would like to do which we are unable to do because of lack of money but I believe that in the future it is going to be easier for us to get funds in order to imitate in some small degree the wonderful institution which Dr. Ziegler has. I would like to ascertain how many nurses he has in charge of a ward and if he has any difficulty in getting plenty of well-trained nurses for the nursery and for the wards?"

Dr. E. M. Colie, said: "I want to say that I was particularly impressed with the architectural and executive planning of this hospital and the very great precautions taken to prevent the contact of the patient once admitted or the patient who is being admitted with the patient already in the hospital and the very great precautions taken to prevent the contact of soiled and contaminated things with those which are clean, which is something that has reached a stage of elaboration which I do not believe obtains elsewhere."

Dr. Charles E. Ziegler in closing the discussion, said: "If time permitted I should like to tell you the story of the Magee Hospital from the very beginning of its existence. We spent much time and effort and believe we have done a creditable thing."

In answer to the questions which have been raised:

1. Dr. Kosmak has referred to the Out-Patient Department as being unique in certain respects. May I say that in its beginnings the Out-Patient Department was modelled after that of the Lying-In Hospital of this city. We soon found however that with but one station, it was impossible to get the women to come with any degree of certainty or regularity to the antepartum clinics because of the long distances, the expense of street car fares and the difficulties associated with transfers, etc. To meet this difficulty we conceived the idea of opening substations in different parts of the city. This was done after a time and eight substations were located in well-established institutions, such as Kingsley House, the Irene Kaufmann Settlement House, the Sarah Heinz House, etc., where we were given the use, without charge, of the clinic rooms for our work. The work has been so arranged that one of the dispensary physicians and the antepartum nurse spends a half day, or as much time as may be necessary, one day each week in each substation on the list. All of the dispensary patients living in the vicinity of the station come to the antepartum clinic every two weeks where the doctor and nurse keep office hours from 2.00 to 6.00 or even 7.00 o'clock in the

afternoon or from 9.00 to 12.00 in the morning. In this way we have covered pretty well the entire city and have gotten into close contact with the class of patients needing our help. Lack of funds alone prevents the extension of the work and even this we hope to overcome in time.

During the first four years of its existence ending April 1, 1916 the Out-Patient Department under the name of the Pittsburgh Maternity Dispensary cared for 2553 cases of labor in the homes. During this period the physicians, nurses and social worker made 42,434 visits to the homes and dispensary substations. The total expenditures amounted to $66,919.21 for the four years. The cost per confinement was $26.21 and per visit was $1.58; 97.7 per cent. of this was absolutely free. The dispensary staff during this time consisted of three graduate physicians, four graduate nurses and a social worker,—all on salaries and devoting their entire time to the work.

I wish to correct the impression left inadvertently, by Dr. Kosmak, namely that the Out-Patient Department is a part of the Magee Hospital. It is a separate and distinct institution and is supported by private subscriptions. Its only connection with the Magee Hospital is one of affiliation in the conduct of the work. Three of the trustees of the hospital are also directors of the dispensary and the medical director of the hospital is also medical director of the dispensary.

2. It has been intimated that the Magee Hospital is rolling in wealth and that the plan and scope of its activities have been made possible by the large amount of money available for the purpose. I wish to correct this impression. We are even now running very close to the limit of our income and it is going to require very careful planning and a good business policy to live within our means. From the first we have included the income in fees from private patients, in the plan for financing the scheme, especially as regards the salaries of laboratory workers and clinical assistants—all time men—whom we hope to retain for a period of years or long enough for them to become trained specialists.

I have thus far presented what may be regarded as the rosy side of the subject. There is another and to us a serious side. I refer especially to the matter of securing a sufficient number of pupil nurses to carry on the work and keep within our income. The Magee Hospital is a special hospital and is dependent upon the pupil nurses of other hospitals who come to us for a three months' course in obstetric nursing. The Pennsylvania State Board of Medical Education and Licensure under the very able leadership of Dr. Baldy is responsible for much of our trouble in this matter. In his zeal to improve the teaching of obstetrics in the state, Dr. Baldy has in my opinion gone too far. The Bureau requires of each medical student before graduation that he conduct under supervision and instruction twelve cases of labor. So far so good, but he did not stop there. In addition he requires of each interne in the hospitals of the state to deliver six cases during his interne year, which year is required before the interne may take the state board examination. The result has been that practically every hospital in the state has been compelled to put in a maternity ward to meet this requirement. Dozens of hospitals throughout the state now give the obstetric training to their nurses in their own insitiutions where they have not the facilities to train them properly. The result has been that the Magee Hospital now finds it a serious matter to secure sufficient nurses to carry on its work. We have been unable to open one floor of thirty-two ward beds on this account. In answer to the question as to the number of nurses which we have for the work: On a floor of thirty-two ward patients and as many babies, we have ten nurses including the charge nurses. We have two units of sixteen beds each—three two-bed wards and a ten-bed ward. Each unit is provided with sterilizers, service rooms, etc., so centrally located and so well equipped that the greatest possible efficiency on the part of the nurses is secured, so that we are able to give excellent care to our patients with the minimum number of nurses.

3. As to the training of midwives, I fully agree with all that Dr. Kosmak has said. This subject has been one of the sore points with me in Pittsburgh. The State Board sometime ago suggested that we open a school for midwives in the Magee Hospital. To this I replied that so long as I occupied my present position neither the Magee Hospital nor the Pittsburgh Maternity Dispensary would give the smallest consideration to this proposition. Four years ago at the meeting in Cleveland of the American Association for the Study and Prevention of Infant Mortality I read a paper on the "Elimination of the Midwife" in which I took issue with your distinguished colleague, Dr. Jacobi on this subject. In his presidential address at the Meeting of the American Medical Association, Dr. Jacobi recommended that 200 schools for midwives be established in this country. I characterized his recommendation as "utter foolishness, impractical and impossible." What he called me later in an editorial which appeared in the Journal of the American Medical Association, made very interesting, even though not very convincing, reading. I do not believe in midwives any more than does Dr. Kosmak.

4. In regard to the teaching: The state requires that each undergraduate student conduct under supervision and instruction, twelve cases of labor. At the University of Pittsburgh, I assure you they get all that is coming to them. From the beginning to the end of each labor case, there is continuous teaching. The instructor stands over the student in each and every case and keeps pounding away until the thing is accomplished. Three students are on duty at a time in the hospital, where they live during their services. Each student with the beginning of his service is placed at the head of the delivery table where he gives under supervision, the anesthetics for four cases during the close of the second stage of labor. He then is moved down to the side of the table and for four cases counts the fetal heart sounds at frequent intervals and records his findings; and controls the fundus during the third stage of labor.

The ninth case in his service, is the student's demonstration case. He scrubs up, puts on gloves and gown and stands on the left-hand side of the table opposite the instructor who delivers the patient. His tenth, eleventh and twelfth cases are delivered under the supervision of the instructor who stands opposite. The student is next sent into the Out-Patient Service where he is required to deliver nine additional cases likewise under supervision. The majority of our students deliver from twenty-five to fifty cases before graduation. One man in the class of 1916 delivered 108 women before graduation.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Forty-second Annual Meeting, Held at Pittsburgh, Pennsylvania, May 31 *and June* 1, 1917.

The President, Dr. Frank Farrow Simpson, *Pittsburgh, Pennsylvania, in the Chair.*

Dr. J. Whitridge Williams, of Baltimore, presented

AN HISTOLOGICAL STUDY OF FIFTY UTERI REMOVED AT CESAREAN SECTION.

This comprised a study of uterine contraction and retraction before the separation of the placenta; also a study of the mechanism of the separation of the placenta, the amount of decidua retained after separation of the placenta, the vascular changes at the placental site, and pointed out some of the indications for the removal of the uterus, notably ascending uterine infection. He likewise presented a study of the scar resulting from previous Cesarean section.

DISCUSSION.

Dr. Edward P. Davis, of Philadelphia, was of the opinion that once a Cesarean section had been done, a spontaneous labor might happen in the same patient without any complication whatsoever; furthermore, a Cesarean section properly done, not followed by infection, led to an absolutely sound uterus without connective tissue.

As to infection and the removal of the body of the uterus, any one who had had considerable experience in Cesarean section realized that the danger point was the uterine body in all doubtful and suspected cases. While it was difficult to say positively that a woman could not recover whose uterus was infected, he thought we would save far more lives in doubtful cases by hysterectomy than by leaving the uterus. He had never regretted removing the body of the uterus in a suspected case, and he had regrets for not so doing.

Dr. Edwin B. Cragin, of New York City, said he desired to utter a word of caution as to the relative safety of a uterus on which Cesarean section had been done, especially if the Cesarean section was done for obstruction. As specialists all of us could appreciate the fact that if a uterus was properly sutured and the puerperium was without infection, that uterine wall would be relatively sound if the original operation was done for such a condition as placenta previa or for eclampsia; but if we were talking to general practitioners and of the safety of the uterus that had gone through one Cesarean section, we must always have that fact borne in mind, namely, if Cesarean section was first done for obstruction, and there was a possibility that the puerperium was not absolutely free from infection, to allow that woman to work her way in labor in the second stage, was to expose her to the risk of a rupture.

Dr. John O. Polak, of Brooklyn, New York, stated that the point that impressed him in Dr. Williams' paper was the fact of fifteen hysterectomies having been done following Cesarean section. This statement was absolutely out of harmony with his experience as to the frequency of the necessity of this operation following Cesarean section. Even with the infection, there was a large proportion of these women who had had their uteri removed unnecessarily. It was likewise the experience of his colleagues in Brooklyn that they had not adopted the suggestion of Dr. Williams or of Dr. Davis of doing hysterectomy, but had treated these infected cases by the extraperitoneal method, and where they knew infection had existed from the history and from repeated examinations through the vulva, they had dealt with these cases on the principles suggested by Sellheim.

Dr. Herman J. Boldt, of New York City, said that while one swallow did not make a summer, he had had one opportunity of doing myomectomy during pregnancy. The woman was four months pregnant and showed symptoms of impending abortion. The myoma was enucleated because of the symptoms present. This woman made a good recovery and went on to term without any trouble whatever.

Dr. John G. Clark, of Philadelphia, said that in connection with the subject discussed by Dr. Williams, Dr. Goodall of Montreal, brought out a rather interesting explanation a few years ago of the so-called myopathic hemorrhages which occurred in women of thirty-five and on. Dr. Goodall believed at that time that the subsequent reconstitution of the blood-vessels in the uterus after the puerperium was due practically to the threading of new vessels into the old and their construction in that fashion. He believed that in the majority of women with myopathic hemorrhages at forty and over we would find patency of the uterus up to the menopause, when there was a failure and bleeding because of successive rings. He had three or four specimens showing apparently one blood-vessel within the other.

Dr. Hiram N. Vineberg, of New York City, stated that a puerperal uterus that was highly septic could be removed without causing a more severe infection. Dr. Williams had had twenty cases of infection, and the conditions at the time of operation were most favorable for the spread of infection, yet these uteri were all removed with recovery. The point he wished to emphasize was that these uteri could be removed with safety, and that there must be suitable cases in which the uterus could be removed and the patient's life saved thereby.

Dr. E. Gustav Zinke, of Cincinnati, Ohio, related one experience that he had had of a woman on whom he did two Cesarean sections, the first time for an elongated cervix and placenta previa, both pronounced. She had a perfectly normal recovery. She became pregnant within two months after Cesarean section and went to term, when he was requested to attend her in confinement. He told her he would do so provided she would submit to another Cesarean section, and he based his position entirely upon the fact that she had an elongated cervix. To overcome this obstacle necessarily meant a prolonged labor, and not knowing exactly the character of the uterine scar, he did not wish to take any chances. She promptly submitted to another Cesarean section, and it was performed at the end of term as nearly as he could calculate and before the symptoms of her labor began after the cervix had been obliterated. To his surprise he found it was another case of placenta previa. The placenta was situated in the lower segment of the uterus, almost centrally implanted. Of the first scar hardly anything could be noticed. The first incision was made transversely near the fundus; the second he made longitudinally, and in both operations the abdominal incision was made above the umbilicus. She recovered from this operation very promptly.

Dr. J. Riddle Goffe, of New York City, supposed that all who had had experience in removing fibroid tumors had made observations in reference to the healing of the wound later, and had appeared to endure subsequent pregnancies. He had operated upon three patients from whom he removed fibroid tumors and they had afterward become pregnant. One recent case was one in which he operated for fibroid tumors at the fourth month of pregnancy. The tumors were removed, and the woman promptly miscarried. Since that time she had been pregnant twice and had borne children normally. The deliveries were perfectly normal.

Dr. William E. Studdiford, of New York City, stated that he had had in the past year and a half two experiences with rupture of the Cesarean scar, the last one occurring about ten days ago. In both of these cases the women went into labor prematurely. In the first case the condition was not recognized, and the prolonged pains led the attending physician to attempt further dilatation of the cervix by the use of the bag, with the result that the woman became infected, and at the time of operation the fetus and membranes were within the abdomen. The uterus had retracted, and the woman died within twenty-four hours after operation.

Dr. George Gellhorn, of St. Louis, said that there were cases in which a very slight subfebrile temperature had been running for ten days or fourteen days after Cesarean section, suggesting the possibility that the wound had separated partially. He had had the opportunity of observing one woman who died about five weeks after Cesarean section from a cause unconnected with the operation. She had a very slight temperature, not more than 99.2° or 99.4° for ten days. He was unable to find any cause for the rise in temperature. At autopsy he found the endometrial side of the incision had separated and gave a picture identical to that shown by Dr. Williams. It was very essential to pay attention to these slight rises of temperature and arrange for the management of the next labor accordingly.

Dr. John A. McGlinn, of Philadelphia, did not believe the dictum "once a Cesarean section, always a Cesarean section," was true, but moreover was dangerous. It was simply a catch phrase which remained in the minds of many people who were not able to discriminate. It should be eradicated from the literature, because the general profession and even the public took hold of this catch phrase and would not allow cases to be Cesareanized when they should be.

Dr. Franklin S. Newell, of Boston, said that his feeling about subsequent Cesarean section was that we were never quite sure about the uterine scar. He had removed three scars at operation during the last winter. In two of them the patients ran a febrile course after the first operation. One of the scars left a mass of muscular tissue which ran through the middle of it, and he felt that if that patient went into labor she would have a rupture. It seemed to him, that a 2 per cent. mortality following Cesarean section in subsequent labors was too high. He did not believe that the mortality following Cesarean section before labor was as high as 2 per cent. We should select these cases carefully, and he thought a woman ran less risk in having Cesarean section done in a subsequent labor under proper conditions.

PRESIDENT'S ADDRESS: GYNECOLOGY; ITS PROBLEMS.

Dr. Frank Farrow Simpson, of Pittsburgh, said it was evident to close observers that for some years the fate of gynecology as a specialty had been hanging in the balance. Inroads had been made by general surgery on the one side and by obstetrics on the other. We were confronted by the ever recurring question, is the continued existence of gynecology as a specialty justified?

The answer lay in the manner in which gynecologists had met their obligations in the past and in their ability to handle the unsolved problems of the future. He took it to be axiomatic that the achievements of the last half century had amply justified the development of that specialty. One needed only to refer to the bibliography of abdominal surgery, to the reduction of its mortality from 40 per cent. or more to less than 2 per cent., to its part in developing the surgery of the upper abdomen to the conservation of organs, structures and functions formerly thought to be beyond repair, and to the large number of brilliant men trained to masterful work in this chosen field.

Notwithstanding this, the specialty should pass and be replaced by other lines of activity unless justified by the needs of the hour and by the part it should play in the solution of many grave problems, confronting the profession at this time. In other words, if the specialty had reached such a point of perfection that its methods were a matter of common professional knowledge, or if it had reached such a degree of decadence that it was capable of no further development, then its individual existence was no longer warranted.

What were some of the problems, and what of them? They related, in part, to the normal and guided cycle of pathological changes; to questions of diagnosis; to the influence of nonsurgical methods; to the perfection of surgical technic; to the practical and scientific results achieved; and to the manner of handling many scientific problems. They were further concerned with such broader problems as the relation between patient and hospital, with such details of hospital management as concerned the teaching of nurses, students and internes, and with the training for a gynecological career and with the teaching of the subject.

While the cycle of inflammatory lesions of pelvic structures was a matter of precise knowledge to the well-trained gynecologist, the surgical *faux pas* of daily occurrence showed clearly that that knowledge was not shared by all who possessed diplomas and years of professional experience. The very high frequency with which carcinoma of the uterus passed beyond surgical control showed that the vast majority of physicians and surgeons had much to learn regarding the simple, practical truths so familiar to experts in this line.

Perhaps the most pathetic consequences of inadequate training for gynecological work resulted from a lack of skill in diagnosis and from failure to properly correlate and interpret physical characteristics and variations in form, function and symptoms, as shown by the frequency with which mistakes in diagnosis occurred in untrained hands; and by the disasters which resulted from rushing ruthlessly into acute inflammatory lesions under the impression that one was operating upon a clean fibroid; mistaking pus tubes for a simple retroversion and telling the patient that a simple ligament operation would suffice, when a hysterectomy was required.

Few would dissent from the opinion that adhesions were the *betè noir* of abdominal surgeons. It was true that in the vast majority of instances postoperative adhesions might be considered a measure of the injury done to delicate structures during the operation, and yet all surgeons of experience had been so unfortunate as to see disastrous consequences of adhesions where the operations were simple, manipulations delicate and limited, exposure short and injury slight.

Much could undoubtedly be done by standardizing methods, such, for instance, as marsupializing the abdomen by the use of the omentum or by tumors, by avoiding or minimizing the use of gauze within the abdomen, etc.

Too great consideration could not be given to those questions of hospital management which concerned both patient and gynecologist. The financial burden of supplying the needs of a modern hospital was undoubtedly great. Questions of practical economy arose daily and merited mature consideration; yet were we often not tempted to feel that the perspective was vitiated and that economy was given too much consideration. For instance, how often did we see impecunious or other patients for that matter, hovering between life and death, left to the tender care of nurses in all stages of training, from the probationary period to the closing months of their service. It was clear that the nurse in training was less skilled in the handling of such cases than the picked graduate. If the graduate was not more skilful than the undergraduate, the hospital was taking her time and offering her nothing in return. The cold-blooded analysis of that situation was that without fully realizing what they did, Boards of Directors, superintendents, superintendents of nurses and hospital staffs occasionally permitted patients' lives to remain more or less in jeopardy by failing to furnish them with well recognized and essential safeguards at critical periods of illness. It was evident that such a condition imperatively demanded prompt, efficient and judicious handling.

As to the question of the training of the gynecologist and the teaching of that subject, was it not true that if the best that was known in any important branch of medicine was to endure, it must be transmitted by those interested in the preparation of the subject, rather than by those who definitely relegated it to a subordinate position? Was this not true, even though the latter teacher was more capable than the former; would not the disappearance of gynecological professorship and hospital physicians tend inevitably to the creation of such a wide diversity of method and of teaching as to cause serious retrogression? It was an axiom of teaching and of surgery, that eternal vigilance was the price, not alone of uniform success, but of that success which approached uniformity. Where, in the whole realm of medicine and surgery, and be it said to their credit, would one find a group of men who more uniformly tried to foresee and to provide for all possible contingencies than one habitually found in the case of well-trained gynecologists. Until such care was exercised and such a surgical conscience was engendered in the profession at large, there would always remain a definite place for that group of abdominal surgeons who had achieved such brilliant success in the past, and who by such methods would continue to do so in the forefront of progress.

In referring to the war, President Simpson said that until this conflict was over, the needs of the army must come first. From the viewpoint of the gynecologist, two things stood out clearly: We needed men and we needed improved methods of treatment for abdominal wounds. More than 20,000 high class medical men were needed now. In order to meet the deficiency, medical men must be made to know that the need for medical officers was real and present. By what process could this be brought about? Were we doing our duty until we supported that cause to the fullest? It was evident that there was here a clear cut individual and collective duty.

In regard to the question of improved methods of treatment, he suggested the great desirability of concerted effort on the part of national organizations to devote their chief thought to war problems during the continuation of war. These were some of the thoughts concerning which he urged the creation of a constructive policy.

Dr. Edw. B. Cragin, of New York, read a paper on

THE VALUE OF THE AVOIDANCE OF SHOCK AND TRAUMA IN THE TREATMENT OF ECLAMPSIA.*

DISCUSSION.

Dr. J. Whitridge Williams, of Baltimore, stated that the question of the treatment of eclampsia was one concerning which the last word had not been said. He agreed with the essayist about sparing the patient every possible amount of shock during the time of delivery. Unlike the essayist, however, he had in the last few years resorted to bleeding which had a very good effect in a considerable number of cases, consequently it was almost a routine in his service now to bleed every woman with antepartum eclampsia, and when he did bleed these women he took away 750 or 800 c.c. In a certain proportion of cases that ended their misery. The woman had no more convulsions; her albuminuria fell; the nitrogenous constituents of the urine rose just as though she had not been bled, and such a woman occasionally went on for some weeks and months, and had a baby at term without further eclampsia. The first thing to do was to bleed the woman, then treat her for toxemia very much after the manner indicated by the essayist, and if improvement did not occur within a reasonable time, the woman should be delivered.

Only a small proportion of cases of eclampsia required Cesarean section. He was not quite so pessimistic about the vaginal operation as the essayist, but he found in primiparous women it was a highly difficult operation; it should only be used in multiparous women with patulous vaginæ.

As to the use of veratrum viride, his results had not been satisfactory.

Dr. Reuben Peterson, of Ann Arbor, Michigan, stated that many years ago he was impressed by what Dr. Cragin brought out in regard to shock in the treatment of eclampsia; that it could be largely avoided. He had seen many operations performed, such as manual dilatation of the cervix, and they took away in the majority of cases what little chance the patient had for recovery. He long ago gave up the use of chloroform in the treatment of eclamptic women. He thought the field of Cesarean section, both vaginal and abdominal, had been slightly limited for a number of reasons. In his experience there was less shock from abdominal Cesarean section. He was perfectly aware that operations were being performed all the time by men who did not appreciate scientific obstetrics. Investigations of both abdominal Cesarean section and vaginal Cesarean section had shown conclusively that if a woman could be taken early in her eclampsia, both operations were remarkably successful in saving the mother and the child. The great trouble is delay, and neither operation had been given a fair chance. He agreed with the essayist about vaginal Cesarean section. It was a difficult operation with the child at term. However, at the eighth month, not beyond that, it was an operation that could be easily done provided the operator was familiar with vaginal work.

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* For original article see page 211.

He had tried veratrum viride, and he had tried venesection, and did not get satisfactory results from veratrum viride. He never could see that the women improved one way or the other. He had seen good results from bleeding, and he had wondered whether all operative procedures, whether vaginal or abdominal Cesarean section, could not be explained somewhat on the amount of blood lost at the time of the operation. Elimination should always be carried out.

Dr. Brooke M. Anspach, of Philadelphia, asked Dr. Cragin and Dr. Williams in how many cases of eclampsia they found acetone and diacetic acid in the urine, and how they meet the condition of acidosis.

He asked this question because during the last year he had a woman to treat who developed very serious symptoms of toxemia more than two weeks after delivery. She had had during the attack three severe convulsions in one day. It was thought that the patient was going to die, but she showed remarkable improvement after the intravenous injection of a pint of a 2 per cent. solution of sodium bicarbonate, and she had another injection the next day and recovered.

Dr. Edward P. Davis, of Philadelphia, said that when we knew the pathology of eclampsia we might know better how to treat it. The keynote was the question of toxemia, but it by no means followed that women in eclampsia deliver themselves or must be delivered, and he would not deliver a woman in eclampsia and toxemia unless she showed signs of going into labor, then he would assist her with the least possible traumatism. His objection to the bag was the fact that its long-continued pressure sometimes exhausted these patients and led to the development of convulsions. Abdominal Cesarean section was rarely indicated, and vaginal Cesarean section still more rarely indicated.

In the use of an anesthetic, oxygen might invariably be employed with the greatest possible benefit. Ether and oxygen were far more efficacious in eclampsia and far less harmful than ether alone. The fetal mortality should be absolutely disregarded. It was not right to let a single chance go against the mother for the sake of a toxemic fetus.

He had come to have a high regard for venesection if it was followed by the use of salt solution or sodium bicarbonate in the vein. As to acidosis, since he had bled and used salines the cases of acidosis had not been so frequent; the end results had been better, so that the treatment of toxemia in his opinion, without eclampsia or with eclampsia, consisted in the vigorous treatment of the toxemic process, avoiding all depressing agencies, whether veratrum viride, chloroform, or hot packs.

Dr. Harold C. Bailey, of New York City, said that, in his opinion, eclamptics were particularly prone to develop shock.

Accouchement forcé was a procedure that had been discontinued in the Bellevue Hospital Service.

In 1900, when they took systolic blood readings, several eclamptics were delivered by that method and in several instances they found there was a drop of 100 millimeters of mercury. They then made blood pressure readings following the use of veratrum viride, and in one instance in which the drug was pushed they found a drop of 140 millimeters of mercury, with the woman in profound shock. Since that time they had not previous to delivery used veratrum viride. From their standpoint, they believed that the medullary centers were depressed in a condition of this kind.

As to vaginal and abdominal Cesarean section, his views were in accord with those of Dr. Cragin.

Dr. Hiram N. Vineberg, of New York City, asked a question which he had asked before, but which, he said, had never yet been answered satisfactorily. In those cases in which the toxemia of pregnancy was attended with marked involvement of the kidneys, with albuminuria and casts, if they were carried along for two or three months, what were the prospects of these women having chronic nephritis afterward?

Dr. Cragin, in closing stated in regard to the experience of Dr. Williams and Dr. Davis relative to venesection, that in his first series of cases he felt as they did and he tried honestly to take a series of cases, to bleed each one, using salt solution following, and he had most unfortunate results. He abandoned that method. Then he had better results. He was free to confess that the series was probably different; they seemed alike as near as he could estimate, and yet his experience was not favorable with venesection.

In regard to the use of veratrum viride, he did not claim great benefit from it; its use in his hands might have been exceptional, and yet in exceptional cases, with high tension and rapid pulse, he believed he had used veratrum viride with apparent success.

In regard to diacetic acid and acetone in eclampsia, he recognized types of cases, one where the liver was greatly involved, the other where the kidney was more involved and in the case where the liver was the more involved, one was apt to get acetone and diacetic acid in the urine, and there soda, as suggested by Dr. Anspach, had proved valuable in his hands.

Relative to Dr. Vineberg's question of eclamptic women going on and having a chronic nephritis, personally, he believed the risk was great, and for that reason he was not willing to let cases with increasing urinary changes, go on under palliative treatment and wait for labor. He believed that just as soon as one could start eliminative methods and get the woman delivered without much shock or trauma, the better for the kidneys, because he had seen in his own experience a number of women who had gone on with a kidney never quite normal, and if that woman became pregnant, she was very likely to have a more severe type of kidney lesion, and more risk of eclampsia in her subsequent labors.

Yet he did not feel quite like disregarding fetal life after seven and a half months of pregnancy. He felt it deserved consideration, and therefore thought that we should treat the woman first.

Maternity hospitals were making advances along the line of prophylaxis. The antepartum clinics and social service work following cases from the start in pregnancy, bringing them for treatment just as soon as they began to show evidence of anything that was toxemic, were going to save the lives of these mothers and their children.

EDITORIAL.

With this number, the editorial conduct of the AMERICAN JOURNAL OF OBSTETRICS passes to Dr. George W. Kosmak.

Dr. Kosmak is known to many of our readers. For the past five years he has shared with Dr. Wells the labors of editing, doing the larger part of the work for some time past. To those who do not know him we may say, if anything need be added to the foregoing, that he is a man of thorough scientific training and experience, of wide general culture, and well fitted, we believe, to carry on the work so ably done by the two former editors of the Journal: Dr. Paul F. Mundé, and Dr. Brooks H. Wells.

THE PUBLISHERS.

THE CALL OF THE HOUR.

The Surgeon General's office has appealed to the medical press of this country for aid in securing the necessary quota of physicians for the purposes of the great war which is now being waged abroad and in which we have been compelled to take an important part. In accordance with this appeal the editors of the American Journal of Obstetrics are placing the facts before their readers and urging each one to carefully consider the situation, as it affects them personally. Briefly stated, it is necessary for the Government to enlist the services of not less than 20,000 physicians in the organization of the large army about to be raised by conscription. In addition to this the regular services of the army and navy are likewise inadequately supplied. In the Medical Reserve Corps of the army there are scarcely more than 3000 members and it is from this body that the physicians who are to care for the health of our newly organized army will be largely taken. The requirements for enlistment in the Medical Reserve Corps of the army and navy are probably familiar to all the members of the medical profession and it is only necessary to review again the general requirements, which are that a candidate for a commission must fill out a personal application blank and send same to the Chairman of the nearest examining board. The list of such chairmen is too long to print but may be obtained from the Surgeon General's office at Washington. If the candidate is accepted the commission is forwarded. First lieutenants, captains, and majors with respective pay of $2000, $2400, and $3000 per year while in service, are the ranks accorded to applicants depending on their individual qualifications.

At the last annual meeting of the American Medical Editors' Association a committee was appointed to consider appropriate ways and means to aid in this recruiting campaign for the medical reserve corps of the United States military forces and the following resolutions were presented and adopted.

WHEREAS the need of Medical Reserve Officers for both the Army and Navy is the paramount question of the day, therefore be it

RESOLVED, that (1) the members of this Association pledge themselves to publish prominently at least three times within the ensuing three months, a copy of the official personal application blank with an explanatory comment on the proper procedure to be employed in transmitting the same to the Surgeon General's office.

(2) That all medical journals of this country be urged to present editorially the needs of the military services in this crisis and the immediate necessity for securing the full complement of medical officers for the same.

(3) That this committee be continued in office after this meeting and be empowered to expend for carrying out the provisions of this resolution a sum not to exceed two hundred and fifty dollars.

(4) That a copy of these resolutions be forwarded to the Surgeon Generals of the Army and Navy and that the Association of American Medical Editors in convention assembled herewith pledges its hearty and unstinted support of all measures designed for the development of the medical forces in this hour of need.

In accordance with the above, the editors of the American Journal of Obstetrics desire to make an appeal to their readers. The physicians of the country must realize that we are engaged in a stupendous undertaking that will demand an unprecedented strain on our resources; mental, moral, physical, and otherwise. This war means a regeneration and reassignment of scientific activities, the import of which will not be realized until after peace is declared and the reconstruction process has begun. The domination of German methods in the field of medicine will undoubtedly be lessened in the future and the absolute subservience to the Teuton in medical thought must be tempered by the progress in independent activities which will be developed to a greater extent among other nations. We had come to depend to such an extent on the emanations from German medical centers that a feeling of dependence had arisen which is most unfortunate for the profession as a whole. To think and to act independently and alone will become the watchwords of the period that we are about to pass through. This liberty of thought and action in the medical profession can only be acquired through a united effort to develop a spirit which will aid in the process of regeneration and which demands actual, direct and personal participation in the forces that have been designated to accomplish these ends. It means particularly the participation by the younger element of the medical profession, men who can be spared from their families and from the civil hospitals. It behooves every member of the medical profession, therefore, to take counsel with himself, to decide whether he can take an active part in the conflict or whether it is necessary for him to remain at home to do the essential work of caring for the civilian population and to take care of the practice of his younger colleague who is physically better fitted for the work of the campaign. An enormous number of physicians is needed and needed at once and if they cannot be secured through the agency of volunteer service it may be necessary to resort to conscription. This is a step which the Government will undoubtedly employ in the near future if the young medical men of the nation, who are best fitted for the work, do not come forward and cheerfully volunteer their services. The physicians of the United States who have thus far entered the conflict and gone abroad have distinguished themselves beyond measure and their aid has been fully recognized by our allies. This record of duty faithfully and cheerfully done should serve as a stimulus to those who have not yet given the matter of enlisting in the medical service due consideration. It should help them in their personal and individual consideration of the duty which they owe to the nation and it is hoped that this appeal will not be in vain, but that among our readers many will be found who are ready to make the great sacrifice in this hour of need.

PERSONAL HISTORY OF APPLICANT FOR APPOINTMENT IN THE MEDICAL RESERVE CORPS, UNITED STATES ARMY.

Give your name *in full* (including your full middle name):..............................

The date of your birth:................The place of your birth:.......................

When and where were you naturalized (if of alien birth)?..........................

Are you married or single?............Have you any children; if so, how many?........

What is your height in inches?.............Your weight, in pounds?..................

Give the nature and dates of all serious sicknesses and injuries which you have suffered:..

....

....

....

Do you labor under any mental or physical infirmity which could interfere with the efficient discharge by you of the duties of a medical officer?..............................

If either parent, or brother, or sister has died, state cause and age in each case:..........

Do you use intoxicating liquors or narcotics; if so, to what extent?......................

Have you found your health or habits to interfere with your success in civil life?.........

What academy, high school, college, or university have you attended? State periods of attendance from year to year, and whether you were graduated, giving date or dates of graduation:...

....

....

Name any other educational advantage you have had, such as private tuition, foreign travel, etc.:...

....

Give all literary or scientific degrees you have taken, if any, names of institutions granting them, and dates:...

....

With what ancient or modern languages or branches of science are you acquainted?......

When did you begin the study of medicine, and under whose direction? His residence?..

....

How many courses of lectures have you attended? Names of colleges and dates:........

....

When and where were you graduated in medicine?...

(Fill this out and send it to the Surgeon General, U. S. Army, Washington, D. C.)

Have you been before a State Examining Board? If so, state when, where, and with what result:..

....

Have you had service in a hospital? If so, state where and in what capacity, giving inclusive dates of each kind of service:..

What clinical experience have you had in dispensary or private practice?................

....

Have you paid particular attention to any specialty in medicine; if so, what branch?....

What opportunities for instruction or practice in operative surgery have you had?........

....

Have you previously been an applicant for entry into the United States service? If so, state when, where, and with what result:...

Are you a member of the organized militia? If so, state with what organization and in what capacity:...

....

Have you been in the military or naval service of the United States? If so, give inclusive dates of service with each organization, designating it:...........................

In case of war or threatened war, will you accept active service for duty with the Army, should your services be needed?..

What occupation, if any, have you followed other than that of student or practitioner?

....

Present or temporary address:†...

Permanent residence:†..

I CERTIFY that to the best of my knowledge and belief the above statements are true.

Signature ☞..................................

Date,..............................., 191

Subscribed and sworn to before me, this.............day of...........A.D. 191

[SEAL] ....

[Signature and official title.]

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† The candidate should give his present address for correspondence, and also his permanent address to which he desires commission sent should be he appointed.

FORM 149
W. D. S. G. O.
(Revised March 6, 1912)

AM. JOUR. OBST., Aug., 1917.

.............................., *M. D.*

OF

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.............................., 191

FURNISHES PERSONAL HISTORY

IN CONNECTION WITH

APPLICATION FOR APPOINTMENT

IN THE

MEDICAL RESERVE CORPS,

U. S. ARMY

..............................*Inclosures*

REVIEW.

COMPEND OF HUMAN PHYSIOLOGY Especially Adapted for the Use of Medical Students. By ALBERT P. BRUBAKER, A. M., M. D. Professor of Physiology and Medical Jurisprudence in the Jefferson Medical College, etc. Fourteenth edition. Pp. 262, with 26 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

Having survived the acid test of thirteen previous editions, this *multum in parvo* is presented to the present generation of medical students with the recommendation of a successful past and with the modifications which physiological progress have necessitated. It gives only the outlines of this extensive subject and these in the simplest terms.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Eclampsia.—The conclusions drawn by E. B. Young (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 486) from a study of 163 cases of eclampsia in the Boston City Hospital are that incidence varies greatly in different years and without apparent cause. Severe attacks occur mostly in primiparæ from 20–25 years, in the latter half of pregnancy. A little over one-half the cases with convulsions have seizures after delivery. Nonoperative delivery is most favorable for the mother. The longer the convulsions continue, the greater the mortality. Child mortality is high whether deliveries are operative or nonoperative, owing to prematurity and toxemia. High blood pressure increases the gravity of the prognosis. Venesection is a useful procedure in cases with high pressure and restlessness after delivery. Induction of labor and delivery with the least possible operative interference offers the best chance of recovery for the mother. Cesarean section is justified in certain cases where delivery by other methods seems too prolonged or doubtful in outcome.

Kidney in Eclampsia.—W. A. N. Dorland (*Med. Rec.*, Apr. 7, 1917) says that the kidney of pregnancy, so called, is not a primary condition, but is secondary to vascular changes in the mother's body. The primary change in the preëclamptic toxemia is a steady accumulation or a sudden influx in the maternal blood of noxious matters of as yet undetermined origin. These toxins immediately produce an irritation of the arterioles of the whole body with a consequent vasomotor spasm and a rise of arterial tension. The arterioles of the renal cortex share in this general vasomotor contraction and prevent the flow of blood to the renal cells. The renal cells, being thus deprived of their blood-supply, show all the manifestations of tissue-starvation, including a suppression or total abolition of their eliminative function. There is no breaking down of the renal tissue with permanent injury of the vital structure of these organs in this disease. The correction of the vasomotor spasm will promptly restore the renal function by reëstablishing a flow of blood to the renal cells. We have, consequently, in all cases of rising arterial tension in pregnant women, an urgent indication for the early administration of vasoparalyzants, especially glonoin and veratrum viride. The secondary action of these drugs is powerfully diuretic when the ordinary diuretics fail to act.

Creatinine and Creatine in the Whole Blood and Plasma of Mother and Fetus Placental Transmission.—Simultaneously collected samples of maternal and fetal blood were analyzed by E. D. Plass (*Johns Hopk. Hosp. Bull.*, April, 1917, 137) for preformed and total creatinine by Folin's method. The determinations on unhemolysed and hemolysed whole bloods brought out no definite information with regard to the exchange between mother and child, but when serum or plasmas was used, a definite relation was clearly established. The concentration of both fractions is the same under normal conditions in the plasmas which are naturally the fluids concerned in the placental interchange. The use of serum or plasma is essential in the study of placental transmission. The plasmas of both mother and child contain the same amounts of preformed and total creatinine. The values are the same as those found in non-pregnant women. The preformed and total creatinine apparently pass between the mother and fetus by simple diffusion.

Obstetrical Significance of Blood-sugar with Special Reference to Placental Interchange.—W. H. Morriss (*Johns Hopk. Hosp. Bull.*, April, 1917, 140) finds that normal blood-sugar values (0.09–0.11 per cent.) prevail during pregnancy and the puerperium. During the early part of labor the values are normal, but in the second stage the blood-sugar is increased. In twenty-eight cases at the moment of birth the average maternal blood-sugar was 0.132 per cent. The rise in the blood-sugar is partly due to the mother's voluntary efforts to expel the fetus, and it is accentuated by the use of an anesthetic. At the moment of birth the fetal blood-sugar is lower than the maternal. In twenty-four normal cases, in most of which an anesthetic was used, the average fetal value was 0.115 per cent. The concentration of glucose in the two circulations is such that the placental interchange may readily be explained by the process of diffusion; and the lower concentration in the fetal blood assures a flow of glucose from mother to fetus. After obstetrical operations higher values are found for the blood-sugar in both mother and fetus, and are explained by the influence of the anesthetic. Normal blood-sugar values prevail in preëclamptic toxemia though a rise occurs just after a convulsion. Also after repeated convulsions or with pronounced renal involvement the percentage of blood-sugar may be notably increased.

GYNECOLOGY AND ABDOMINAL SURGERY.

Palliative Treatment of Inoperable Carcinoma of the Cervix by Radium.—Without making any claim that permanent results have been obtained, R. T. Frank (*Jour. Cancer Research*, 1917, ii, 85) reports twelve cases of carcinoma of the cervix treated with radium. He says that radium is our best palliative measure in inoperable carcinoma of the cervix. Far advanced cases may be treated with radium. It not only rapidly relieves the pain, hemorrhage, and discharge, but indirectly also improves the general health and condition. The minimum quantity of radium substance needed is 50 mgm. "Border line" cases or operable cases should be submitted to operation after a short preliminary course of radiation. Good primary results may then be expected from simple total hysterectomy. Operated cases should be subjected to postoperative, prophylactic radiation, beginning not later than four weeks after operation. The technic of radium treatment of cervical cancer is simple and easy to learn. Judging from the limited penetrating power of the rays and the variation of resistance of different cancers, it seems probable that numerous disappointments will occur, and that in many cases positive harm will be done by enthusiasts who refuse to submit operable cancers to surgical operation.

Myomas of the Uterus; Myomectomy.—Myomectomy for myomas of the uterus has not been a popular operation. It has been urged against it, first, that the mortality of the procedure itself is higher than that of hysterectomy, and, second, that more tumors would develop and necessitate hysterectomy later. As to the mortality: W. J. Mayo (*Jour. A. M. A.*, 1917, lxviii, 887) reports from Jan. 1, 1891, to Sept. 1, 1916, 504 consecutive myomectomies with four deaths in the hospital, a mortality of 0.8 per cent. Counting as a death from the operation every patient who died in the hospital following myomectomy, without regard to cause or length of time after operation, this mortality compares favorably with that of hysterectomy. As to the second objection, only five patients required hysterectomy later for any cause. It must be taken into consideration, however, that the patients subjected to myomectomy were in a way selected cases. Myomectomy was done for the majority of patients with myomas who were under thirty-five years of age, and for practically all under thirty years. Twenty-four of the 504 myomectomized patients have had living children since the operation and seven have had two or more. Thirty-eight living children to date following myomectomy is a strong argument for the conservative operation. Five others are normally pregnant now.

Operation for Procidentia Uteri.—This is described by W. T. Helmuth (*Annals Surg.*, 1917, lxv, 469). After amputation of the cervix and completion of repair work on the perineum, the abdomen is opened in the median line and the intestines are walled off with packing gauze. The operation proceeds as in the usual hysterectomy, the round ligaments, broad ligaments and Fallopian tubes being severed, and the peritoneum sewed down to the attachment of the bladder and around the cervix. The uterus is then split longitudinally downward, to the point where the bladder is attached to the cervix, and the endometrium dissected out, from each cut section. Two incisions are now made through the aponeurosis and body of the rectus muscle, and through the peritoneum; each incision being distant ½ inch from the central incision through the rectus muscle, and each running in a direction parallel to the central incision. Each of these incisions should be large enough to permit one segment of the bisected fundus to be drawn through it. A pair of vulsellum forceps is inserted through each of these incisions, and the segments of the divided uterus are drawn through the apertures. The central incision through the rectus muscle and peritoneum is sutured, and the two parts of the uterus are brought together, being then sewn over the now united aponeurosis and muscles. The skin and connective tissue are closed after the usual fashion. The results have always been satisfactory.

Retroversion of the Uterus.—J. T. Williams, *Bost. Med. and Surg. Jour.*, 1917, clxxvi, 558) divides retroversions of the uterus into three classes: (*a*) Inflammatory, in which the uterus is displaced by a pus mass and the fundus afterward drawn backward by adhesions. (*b*) Congenital, in which the retroversion may be said to be the normal position of the uterus for that individual. (*c*) Acquired, as the result of injury or relaxation consequent upon childbirth in which the retroversion is not a condition *per se*, but a part of the general process of prolapse. In retroversions of the first class, treatment is directed primarily to the inflammatory process and the displacement is corrected only incidentally. Congenital retroversions are usually symptomless and require no treatment. Retroversions acquired as the result of parturition should be considered as a step in prolapse of the uterus and the downward as well as the backward displacement corrected. Retroversion is an infrequent cause of sterility in itself. Retroversion may cause miscarriage if the uterus becomes incarcerated but most retroversions are corrected spontaneously during the early months of pregnancy. A retroverted uterus discovered on postpartum examination, if obviously congenital in type, needs no treatment. If of the acquired type, the malposition should be corrected and treatment by pessary instituted, deferring operation if possible until the patient has passed the child-bearing period.

Fascia Transplantation into Visceral Defects.—H. Neuhof (*Surg. Gyn. and Obst.*, 1917, xxiv, 383) presents an extensive experimental and clinical study. He says that the free transplantation of fascia into aseptic fields has a wide sphere of usefulness. Fascia (lata) is most readily accessible, is obtainable in almost unlimited quantities, its removal does no damage. Transplanted fascia has a remarkable tendency to heal in place even under most disadvantageous conditions, requiring minimal nourishment to obviate necrosis. It combines great tensile strength with slight tendency to stretch or to contract. It is most readily adaptable to the shape of any organ and, technically, can be most easily handled. Finally, fascia can be invariably transplanted autoplastically. The ultimate fate of transplanted fascia has not been definitely determined. The experiments reported indicate early disintegration in nonaseptic fields, degeneration at later periods in aseptic fields. Of practical importance is the fact that the resultant firm connective tissue is as serviceable as the original transplant. The technic employed in these experiments on hollow viscera and on other organs was the attachment of the transplant over the defect. To offer chances for uniform success a method was evidently required to prevent the cut margin of the organ from rolling back, to give sutures a firmer hold on the organ by passing them through all its layers, to more readily supply the graft with provisional nourishment, and to invite the overgrowth of the lining mucous membrane of the organ. These requirements were met satisfactorily by suturing fascial sheets into instead of over defects of hollow viscera and other organs. In abdominal organs the following results were obtained. Large vesical defects (up to about one-half the bladder wall) were replaced by fascia with uniform success. The functional and anatomic results were excellent. They were attained by the upbuilding of a new bladder wall. Epithelial overgrowth at the site of the defect was complete at an early stage. The newly formed bladder wall was as thick as or thicker than the remainder, and equally or more resistant to pressure from within. This was probably due in part to the fact that bone appeared invariably at the site of the defect, definitely limited to that area. The osseous tissues appeared remarkably soon after operation, reaching the height of their development in the second or third month. In conjunction with the bone there was formed typical bone marrow (and cartilage, in one experiment) and an ensheathing, periosteum-like layer of connective tissue. That the transplanted fascia as such was not responsible for the formation of bone, was demonstrated by the development of osseous tissue when fat was used to bridge vesical defects. The formation of bone and related tissues was explained by the theory of connective-tissue metaplasia, the assumption being that calcium salts, derived from the urine, were the centers of stimulation. Another uniform feature was the presence of smooth muscle in the connective tissue occupying the defect. It was continuous with the muscle of the bladder wall. Its presence was accounted for on the basis of smooth muscle regeneration. The immediate anatomic and functional results of replacement of extensive ureteral defects by tubes of fascia were satisfactory. Ultimate results could not be ascertained. Perforation through the transplant invariably followed its simple implantation into gastric defects. On the other hand, smooth healing always occurred, even with very large defects, when gastroenterostomy, with or without pyloric exclusion, was added. This striking contrast demonstrates the profound influence of gastroenterostomy upon healing of gastric lesions near the pylorus. Healing was firm and complete, gastric mucous membrane completely overgrowing the site of the defect. In one instance bone formation in the scar tissue was observed. Fascia transplantation into small defects in the upper part of the small intestine was occasionally successful, succeeded more often in the lower part of the small intestine, was most successful in the large intestine. In the latter, larger defects could often be satisfactorily replaced. Healing took place by the upbuilding of new tissue and partial epithelial overgrowth, as well as by some contraction of the defect.

Simulation of Ectopic Pregnancy and Early Uterine Abortion by Corpus Luteum and Retention Cysts of the Ovary.—I. C. Rubin (*Surg., Gyn. and Obst.*, 1917, xxiv, 443) states that menstruation in married women is often delayed for periods varying from a few days to a month. During this period of temporal amenorrhea, the patients naturally regard themselves as pregnant. Not infrequently physical examination in such cases of delayed menstruation will reveal the uterus actually changed in size and consistence thus further justifying the presumptive diagnosis of pregnancy. However, in spite of this subjective and objective evidence, the diagnosis may be left in complete doubt by the onset of the menstrual flow which apparently differs in no way from the usual menses for that particular individual. Occasionally in addition there may have been found on palpation an extrauterine mass, more or less tender, which excites the suspicion of an ectopic pregnancy. This extrauterine mass may make the impression of an enlarged cystic ovary or be more or less elongated and simulate an enlarged dilated tube. Pain in the lower abdomen and cramps may also be complained of. In other words there may be present the essential points in the history and physical findings of the patient to lead to the diagnosis of an ectopic pregnancy. Occasionally too, the cystic mass may be unmistakably ruptured by the examining fingers thus further simulating a ruptured ectopic gestation sac. Yet neither in the subsequent course nor at laparotomy is an ectopic pregnancy proved. Instead, a retention cyst of the ovary varying in size from a plum to a small orange is the only abnormal finding. This cyst may be a simple retention cyst histologically with or without lutein cells, or it may be a genuine corpus luteum cyst. These arise either as a result of early death of an intra- or an extrauterine embryo, the subjective symptoms being wholly due to the gestation itself; or arising as a result of trauma or degenerative changes in the ovary, the corpus luteum cyst may induce secondary changes within the uterus, enlarging it, softening it, prolonging the decidual (premenstral) phase, and inhibiting the onset of the menses. From an analysis of the histologic findings in the cases personally encountered, it appears that corpus luteum cysts and retention cysts of the ovary may simulate early terminated intra- or extrauterine pregnancy without either of these conditions actually having been present. On the other hand it is more likely that in the majority of instances these retention cysts result secondarily through early embryonal death whether the impregnated ovum lodged within the uterus or within the tube. The ovum is in these instances disintegrated and absorbed and restitution (involution) takes place without the external or internal hemorrhage which we are accustomed to see in uterine or ectopic abortion. In all probability a great many non-tragic ectopic pregnancies terminate in this way.

Effect of Removal of the Gall-bladder.—By an experimental study on dogs, E. S. Judd and F. C. Mann (*Surg., Gyn. and Obst.*, 1917, xxiv, 437) show that after removal of the gall-bladder, all of the ducts outside the liver dilate. The sphincter at the entrance of the common bileduct into the duodenum is the chief factor in producing this dilatation. After cholecystectomy, this sphincter can withstand only a small percentage of the pressure which it normally maintains. When all the muscle fibers are dissected free from the intramural portion of the duct, the biliary tract does not dilate after the removal of the gall-bladder.

Method of Supporting the Bladder in Certain Cases of Cystocele.—H. L. Smith's (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 591) method consists in attaching the uterus to the posterior-inferior surface of the bladder, the cervix being sutured firmly to the band of the triangular ligament which runs below the urethra and spreads out laterally, in a fan-shape, to the pubic bones. By this maneuver the bladder pouch is tucked up into the pelvis, and the bladder as a whole rests upon the anterior wall of the uterus as upon a shelf—just as it does upon the posterior wall of the uterus in the interposition operation. The classes of cases in which the procedure would seem to be indicated are: 1. Very aged or infirm women, where a prolonged vaginal technic or abdominal section would not be safe. 2. Cases where the uterine body is already high up in the pelvis as the result of previous operations, but without relief of the cystocele. 3. Cases where the body of the uterus has to be removed, as in the case of uterine fibroids already described, and in which the bladder has become so stretched that merely supporting the stump from above will not iron out, so to speak, the cystocele pouch.

Chronic Hemogenic Salpingitis.—W. C. Danforth (*Surg. Gyn. and Obst.*, 1917, xxiv, 327) reports a case of chronic salpingitis. Cultures from the tubes yielded only streptococcus hemolyticus. Cultures from the tonsils during an acute tonsillitis one year before this operation had given a pure culture of streptococcus, and one from an alveolar abscess gave the same result. The original focus from which the entire process was derived may logically be supposed to have been in the alveolar abscess and the tonsillar infection a secondary one. The tubal infection can only have been a hemogenic one and must have come from the foci in the tonsils or teeth. While the extreme frequency of tubal infection by way of the genital canal cannot be questioned, we must admit that hemogenic infections are decidedly more common than we have been accustomed to suppose.

Failing Cardiac Compensation during Pregnancy.—C. H. Lawrence (*Bost. Med. and Surg. Jour.*, clxxv, 858) says that, given a patient who has had slight failure of compensation which disappears under proper treatment, she should be kept under the influence of digitalis, taking it, for example, five days a week during three weeks each month unless it upsets the stomach. The alternative which would be chosen for the nonpregnant patient, rest in bed so long as compensation cannot be maintained without the aid of drugs, tends to produce muscular weakness and constipation, and is not the logical way to prepare the heart for the extreme effort of labor. The elimination of carbohydrates, and the division of the necessary amount of food into six small meals, often adds greatly to the comfort of a patient with slight cardiac inefficiency. If digitalis is given, as suggested, any emergency arising during the period of its omission can be met by intravenous medication. If acute cardiac dilatation occurs venesection may make all the difference between life and death. The amount of blood it is necessary to withdraw materially to benefit the heart is usually not over 10 or 12 ounces. Venesection should not be withheld in the presence of acute cardiac dilatation from the fear of subsequent loss of blood. For the stimulation of the myocardium digipuratum intravenously, or if the patient cannot take digitalis, strophanthin intravenously have given the best results.

Vaginal Hernia and its Treatment.—Henri Hartmann *Ann.* (*de gyn. et d'obst.*, Nov.-Dec., 1916) distinguishes between vaginal prolapse and a true hernia with presence of intestines in the vagina contained in a hernial sac. He cites a case observed by him in which the intestine had descended between the wall of the rectum and the posterior wall of the vagina, and the pouch protruded from the vulva like a prolapsus uteri. The hernia came through the upper wall of the vagina, the lower portion of the vaginal wall and perineum being intact. In this case a hysteropexy had been done, which held the uterus in such a position as to allow a free passage for the intestines between the rectum and vagina, and increased the pressure from the abdominal contents. In order to prevent recurrence of the hernia we must remove the sac. As this cannot be easily done by separating the serous covering from its basal membrane the author closed it by stutures after resection of the protruding portion in the vagina.

Closure and Filiform Drainage of the Pelvis.—H. Chaput *Ann. de gyn. et d' obst.*, Nov.-Dec., 1916) distinguishes between "gloisonnement" of the pelvic basin and "peritonization." To close the basin is to isolate one of the culdesacs of the basin by a peritoneal fold both faces of which are free. Peritonization is an autoplasty with folds of peritoneum in such a way as to cover bleeding surfaces with serous tissue: the deep faces of the folds are applied to a surface to be covered. We peritonize after a simple salpingectomy when we suture the serous surfaces of the broad ligament. The varieties of "cloisonnement" are transverse, subvaginal, posterior vertical, and vertical anterior. The technic of each variety is explained. Drainage is unsatisfactory, and filiform drainage is the best. This is drainage by a tube through the vaginal wound between the sutures. It may be abdominovaginal, abdominopelvic, vaginopelvic, or rectopelvic.

Indications for Cholecystectomy.—F. B. Lund (*Surg. Gyn. and Obst.*, 1917, xxiv, 275) says that the gall-bladder should be removed under the following conditions: (1) In cases of very thick, acutely inflamed, brightred, or gangrenous gall-bladders due to impaction of a stone in the cystic duct. (2) In cases of chronically thickened gall-bladders. Here (*a*) the thick walls cannot contract and drive out the bile, so that what bile gets back into the gall-bladder is sure to stagnate there; and (*b*) after cholecystostomy, the walls do not contract, so that we get a mucous sinus for a long time, or for life. (3) In cases of gall-bladders very much distended with clear fluid from impaction of a stone in the cystic duct. Here the duct has been closed and probably ulcerated and strictured by the irritation of the stone, so no bile gets back. (4) Whenever suspicion exists of malignant disease. (5) In chronic cholecystitis without stones, but with moderate thickening and ulceration of the mucous membrane, giving little yellow spots on the mucous surfaces, the so-called "strawberry gall-bladder." These do not get well with drainage alone. (6) In chronic cholecystitis without stones but with adhesions to the surrounding organs, especially the pylorus, which cripple the latter and cause symptoms. Here, also, drainage alone is only temporarily efficient. The gall-bladder is a constant focus for low-grade infection and adhesions, which will continue to form and perhaps spread until its removal. (7) In all cases of gall-stones in which the operation is not for any reason unusually difficult or dangerous; and all cases of cholecystitis without stones where the same conditions exist. Cholecystostomy should be performed: (1) In all cases of acutely inflamed gall-bladders, with or without stones, in which the patient's condition or the technical difficulties render the removal of the gall-bladder unsafe. (2) In cases of pancreatitis with jaundice. Here cholecyst enterostomy should be performed if possible; if not, cholecystostomy. (3) In cases in which the common duct is strictured, or is likely to become so, and in which the gall-bladder has not been already removed, or is not too thickened and contracled to be of value for purposes of anastomosis. This presupposes a patent cystic duct.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Twenty-ninth Annual Meeting, White Sulphur Springs, W. Va., May 28, 29, 30, 1917.

The President, DR. FRANK SPOONER CHURCHILL, *Chicago, in the Chair.*

PRESIDENT'S ADDRESS.

THE RESPONSIBILITY OF THE AMERICAN PEDIATRIC SOCIETY IN THE PRESENT NATIONAL CRISIS.

"In this most critical period in our nation's history we each and all of us are asking ourselves—"What is my duty—what ought I, what can I do to help my country in its present crisis?" These questions we ask not only of ourselves as individuals, but of societies and organizations. It seems to me fitting on this occasion that I should point out some of the directions which our efforts to help may take in order that we may take council together and if possible evolve definite ways and means of contributing our share toward the solution of the many problems in which our country finds itself involved. The advice to the individual has been 'Do for your country that which you are best fitted to do.' Similarly, with a society or organized groups, it can say: 'Let us do that which the nature of our organization makes possible for us to do well and efficiently; let us make as far as possible the same mental and physical efforts we have always made, but let us now turn these efforts more than ever, in the direction of the country's good.' Clearly then, the direction which the contributions and efforts of this Society should take is that which will best safe-guard the child life of the country, not only from those dangers already existing but, in addition, from those which will inevitably arise as a result of the war. We may meet those problems in a two-fold manner: by continuing agencies already devoted to the interests of children and, second, by making renewed and greater efforts to meet new problems. We both as individuals and as an organized group should lend substantial support and influence toward the continuation of active organizations devoted to the welfare of infants and children, since there is apparently danger that the beneficient activities of these organizations may be curtailed by cutting the appropriations to public ones and by failure of subscriptions to the private ones. This would be suicidal and destructive. War always leaves in its wake pain and suffering, devastation and destruction, and one of its most cruel results is the effect upon the young and helpless. We must exert ourselves to minimize this injury to our young. Such efforts are demanded by both humanitarian anc economic reasons.

"The physical problems to be met had to do largely with nutrition and bodily sickness. There will be two groups of children requiring attention, the children of the poor and the children of enlisted men. The latter group must be the object of our special solicitude. It is within the power of this and other groups of pediatricians, by organized effort, to render great service to the children of these fighting men, not as a gift but as a just payment from us. Great care must be exercised that the nutrition of children does not suffer as the result of enforced economy by large numbers of the population. Our organization could well and profitably concern itself with an intensive study of food stuffs for the young, draw up diet lists embodying the result of such study, naming articles of food of proper nutritional quality, giving the caloric value and wherever possible suggesting cheaper substitutes for the present high-priced articles. The widespread publication of such diet lists in both lay and medical press, emanating from the American Pediatric Society, would carry weight and authority and would undoubtedly be of service to large numbers of people.

"Equally important with the problem of nutrition of the child are problems of a moral nature involved in the questions of child labor and delinquency. We have had ample warning of the danger in both directions from the experience of the warring countries. It is estimated that there has been in these countries an increase of 34 per cent. in juvenile crime and delinquency. Existing child labor laws should be enforced and juvenile protective associations should be heartily supported. Our part in this war is to 'fight in terms of the next generation.' The quality of that generation will be the measure of our victory in the war. The members of the American Pediatric Society are also active in the American Medical Association, in state and municipal pediatric societies and in various civic lay organizations. We thus have at hand the machinery for executing on a broad and comprehensive scale plans for the protection and preservation of the child life of the nation."

PRIMARY CARCINOMA OF THE LIVER IN CHILDHOOD

Dr. J. P. Crozer Griffith, Philadelphia.—The occurrence of carcinoma to neoplasms in infancy and childhood is uncommon as compared with adult life. Carcinoma of the liver appears to be more frequent than sarcoma. The following case was referred to me with the following history: The patient was a female child, twenty-one months old. The family history was negative and the child had previously had good health, except for some degree of anemia supposed to be dependent upon indigestion, and a constant tendency to constipation. Her appetite had for weeks been abnormally great, and for some time she had had attacks of vomiting nearly every morning. Five weeks before her father had accidentally discovered a lump which could be felt beneath the costal margin on the right side in front. There was an unusual, amount of veining of the walls of the thorax and of the distended abdomen. The child had lost weight. Physical examination showed, below the costal margin, midway between the midsternal and the right mammillary line, a decidedly visible prominence, which on palpation was found to be a hard, smooth mass, apparently with a rather firm edge. It appeared to be connected with the liver. It changed its position distinctly with respiration. The liver as a whole seemed enlarged. A provisional diagnosis was made of tumor or cyst of the liver. The *x*-ray seemed to show opaque bodies in the tumor mass, suggesting the diagnosis of teratoma, connected with the kidney or suprarenal body. At operation situated in the right lobe of the liver was a dark, gray glistening fibrous capsule, covering a tumor mass the size of an orange, which projected slightly above the surface of the organ and extended in depth through the entire thickness of the lobe. Inasmuch as the case appeared to be inoperable, the wound was closed. Histological examination of a small portion of the tumor removed stated that the nodule consisted entirely of epithelial cells without trace of liver tissue. Professor Allen J. Smith later examined the specimen and agreed as to its nature and ventures the belief that the growth was originally a cancer of the bile ducts. The subsequent history of the case was that the growth continued to increase in size, sometimes rapidly, and at other times more slowly. The superficial veins grew more prominent. The tissues about the navel grew discolored and very thin. There was no ascites or edema. Death occurred about nine months from the time the writer first saw the case.

The writer[1] has reviewed the forty-four cases collected by Steffen and Castle and thirteen additional cases are given in abstract form, including the case reported, making in all fifty-seven cases. Of this series twenty-five were in males, twenty in females. In other instances the sex was not mentioned. The age of the patients recorded varies from birth to sixteen years. There were eight cases in the first three months of life and sixteen in the first year of life. The occurrence of so many early cases suggests the existence of a tumor of an embryonal nature. Others are simple carcinoma; others clearly adenocarcinoma and still others some of which the writer has ventured to include provisionally are described as adenoma. Metastases were not uncommon. The symptoms have been entirely uncharacteristic and depend to some extent on the mechanical effect of the growths. There is found emaciation, cachexia natural to carcinomatous neoplasms. Icterus and ascites have been noted in some instances, but more frequently they are absent, or no statement is made regarding them. Operative interference was attempted on only one instance and that without success. It could only be done in the case of single encapsulated tumor. It would seem justifiable to make an effort at removal whenever in any way possible.

INTRAVENOUS INJECTIONS IN INFANCY.

Dr. Charles Hunter Dunn, Boston.—The principal difficulty attending intravenous injections and transfusion in young infants has always been a technical one due to the extremely small size of the veins. The longitudinal sinus in the infant is a large vein very easily accessible through the open fontanellé. If the employment of this route in performing transfusion avoids the principal technical difficulty, it is available not only for transfusion in hemorrhagic disease of the new-born, as suggested by Helmholz, but is also available for the giving of intravenous injections and medication. At the Infants' Hospital we have adopted the use of the longitudinal sinus for the purpose of obtaining blood for the Wassermann reaction, and of giving intravenous injections. The technic has proved to be extremely simple and apparently free from danger, except perhaps when salvarsan is used. We have used the longitudinal sinus for the giving of normal salt solution, sodium bicarbonate in acidosis, of antitoxin in diphtheria, of circulatory stimulant drugs, and of solutions of dextrose. It is the latter which I wish especially to consider at the present time. The cases in which the intravenous injection of dextrose was used were approximately all of the same type. They were cases of extreme atrophy and inanition produced by various forms of gastrointestinal disease. All the cases reported in the present series were infants who were either admitted to the hospital in an actually moribund condition, or, who, after admission, became steadily worse under all ordinary methods of treatment.

The theoretical basis for the use of intravenous dextrose injections in such cases is that apparently the vicious circle produced by gastrointestinal disorder has become so extreme that the digestion and absorption of sufficient fluid to furnish energy requirement of the body is impossible. Dextrose is the only food substance which exists outside of the body in the same form in which it circulates in the blood and is utilized by the tissues. Consequently it seemed that introduced directly into the blood it might, though a temporary supply of even a small quantity of fuel, break the vicious circle for a sufficient length of time to permit improvement of the condition to take place.

The technic used is very simple. A syringe sufficiently large to hold the entire quantity of fluid to be given is connected with the needle by means of a flexible rubber tubing. There is a glass window in the tube just above the needle. The needle used is of the same size as that used for lumbar puncture in infants. After sterilizing the apparatus the syringe is filled with a sterile 5 per cent. solution of dextrose. After expulsion of the air in the tube, the needle is entere dat the posterior angle of the fontanellé. Three persons are required to give the injection, one to steady the head of the child, one to manage the syringe and one to manipulate the needle. After entering the sinus, the piston of the syringe is slightly and slowly withdrawn until blood appears in the glass window. This shows that the needle is actually in the sinus. The movement is then reversed and the dextrose inserted very slowly. By this method we are sure the dextrose is going into the sinus.

In determining the quantity of dextrose we rather arbitrarily adopted a 5 per cent. solution. We began with a quantity of fluid which it was safe to inject, and as it produced no bad results we adopted this amount as a standard for the intravenous injections. In choosing the quantity of dextrose for intravenous administration to an individual baby, one-sixtieth of the body weight was taken. In eighteen of our cases the records are sufficiently complete for the purposes of this report. In some of the cases the improvement which followed the injections was so immediate and so striking that it seems to me that there is a possibility at least that the injections produced a good effect. All the cases it must be remembered were of a type in which a fatal ending seemed imminent. Of the eighteen cases thirteen died and five recovered. After the injections seven cases showed no improvement, five showed a slight temporary improvement, and six showed a very striking improvement immediately after the injections. There is, however, no evidence that the improvement, even if it was due to the intravenous injection, was due to the dextrose. The giving of fluid into the circulation in cases of this character is a therapeutic procedure of known value and it is quite possible that the apparent improvement was due to the fluid and not to the dextrose. There is, however, in my opinion, sufficient possibility of the dextrose being of value to warrant its further trial. Careful urinary examinations in these cases showed that whether or not the dextrose produced a favorable result, it was at least utilized by the child's metabolism. In five cases more than one injection was given and in one case six daily injections of 3 grams each of dextrose were given and in this instance the patient was practically kept alive by the dextrose and eventually recovered.

DISCUSSION.

Dr. Henry F. Helmholz, Evanston, Ill.—We have been doing work of the same kind though more on the physiological side. Dr. Woodyatt has devised a pump by which we can introduce the sugar solution at a uniform rate, and the rate can be varied at will. We have found that with the injection of about 0.8 of a gram per kilo body weight no sugar would be excreted in the urine. We have not tried giving the sugar to the class of cases that Dr. Dunn has reported so I cannot say whether there is a lessened sugar tolerance in such cases. I think that in the concentration in which we have used the dextrose there is no danger of overloading the circulation and putting too much strain on the heart.

Dr. Godfrey R. Pisek, New York.—We have been using a syringe so constructed that we can withdraw the blood and then in making the injection use the gravity method. This provides an additional element of safety and eliminates the possibility that an overzealous interne may run the fluid in too rapidly.

Dr. Howard C. Carpenter, Philadelphia.—I would like to speak a word of warning against the injection of too powerful drugs. In a case in which salvarsan was given and the technic was supposed to have been properly carried out, the child died about eleven days afterward. At autopsy an abscess was found on the frontal lobe of the brain.

DR. ALFRED F. HESS, New York.—I am reminded of a hemorrhagic case in an infant in which the longitudinal sinus was used for aspiration. This child died and it was found that the blood had gone down along the side of the brain between the skull and the brain. Since this experience I have felt some hesitancy in entering the sinus in hemorrhagic cases.

DR. JULIUS P. SEDGWICK, Minneapolis.—We have been using this method of going through the longitudinal sinus. We have used it in a few instances in hemorrhagic disease in which I believe it has saved the child's life.

DR. HENRY F. HELMHOLZ.—I have seen three cases within the last three months all of which resulted fatally. These were not my cases. Although in all three cases the injection was carefully given the entire cortex as well as the base of the brain was covered with blood. It seems to me that as the blood was over the base of the brain as well as the cortex some pathological condition was to blame.

DR. CHARLES HUNTER DUNN of Boston.—It would probably be safe to give a stronger solution than we gave. We did not use the dextrose in a very concentrated solution because in the beginning of work of this kind one has to proceed very cautiously.

As to the giving of salvarsan, I think we may perhaps make an exception of that. We gave it a number of times and everything seemed to go perfectly well; then two cases died after having been given salvarsan. Though nothing could be shown at autopsy that could be attributed to the salvarsan we stopped giving it in this way.

We made observations on a case of severe acidosis that had been given intravenous injections of sodium bicarbonate, and in spite of this treatment was going down hill rapidly. We gave this child a large injection of dextrose and the child recovered.

THE THERAPEUTIC USE OF BLOOD SERUM.

DR. ROWLAND G. FREEMAN, New York.—In a case of hemorrhage in a new-born infant to which I was called hurriedly, and found the child in a critical condition, I gave an injection of 15 c.c. of blood serum (from the father's blood), and the bleeding was controlled and the child went on to normal development. This so impressed me, even though there was nothing unusual in the reaction of the blood serum in this case, that it brought up the question whether this treatment might not be applied to other conditions with good results. Of these conditions one which we always have with us and in which our results are not good is marasmus. I happened to have at this time in my service at Roosevelt Hospital a baby, seven months old, who came in weighing 12½ pounds, and who though fed on different promising foods, excepting breast milk, continued to lose. One month after admission he had lost a pound and I thought one day in making my rounds, because of the appearance of the child and his grayish color, that he was dead. He was, however, still alive. We gave him hyperdermoclysis 250 c.c. This was followed by a rise of temperature and an increase of several ounces in weight. On the following day 20 c.c. of horse serum was injected. This was followed by a temperature reaction up to 102 as occurred on two following days when he again received injections. Seventeen days after this treatment was commenced the child had gained 1¾ pounds and the treatment was given only every second day, but a larger amount of horse serum was given. A little less than a month after treatment was commenced the child's condition was so satisfactory that the injections were discontinued; his improvement, however, continued. This baby, we think would certainly have died without this treatment. Recently I have had on my service at Roosevelt Hospital four children at the same time with a weight of 5 or 6 pounds; all were about two months old, and all had been labored on with different sorts of feedings continuously since their admission. On the same day treatment was started on all four babies. The histories of these cases seemed to show that when the injections were stopped the improvement was not so rapid and indeed there would be a loss in weight, but as soon as the injections of horse serum were resumed the children again gained in weight. After giving two injections of horse serum it is advisable to test the child for sensitization before giving a third injection. In the second baby in this series the test with a drop or two of horse serum was followed by development of a urticarial rash; this child was considered sensitized and no further horse serum given. In one case of miliary tuberculosis with consolidation and cavity, which lost from 26 to 18½ pounds, and under fresh air and heliotherapy gradually gained to 26 pounds at which she remained stationary for weeks, 20 c.c. of horse serum repeated once apparently started her gaining again. I have not attempted to describe all the cases in which this treatment was used, nor do I hold that it is in any way a panacea. It is, however, under proper control a safe procedure and in some almost hopeless cases apparently produces marked improvement. It seems to the writer that it has a much greater sphere of usefulness than has previously been appreciated. It has seemed of no use to give doses of less than 20 c.c. of the serum.

Dr. Herrman.—About a year ago we had an epidemic of this type during which there were some twenty-six cases, two of which were extremely severe. Being unable to obtain human blood we used horse serum and with very good results. Both of these children were very sick, and they probably would have died. These children did well with the horse serum and horse serum is easy to obtain though theoretically human serum would be better. As a rule there is no difficulty in getting human serum for children as the parents are usually willing to act as donors. The question is whether it is necessary to use serum, whether the whole blood would not be as good as the serum.

Dr. Talbot.—It would be interesting to know what Dr. Freeman has done for the future of these babies, particularly those that developed a reaction to one or two injections of the horse serum, to what degree they will be sensitized in the future.

As to this form of treatment, I have not been as much impressed by these charts as I would like to have been. I have seen quite a number of babies that have shown the same improvement as is shown on these charts without any treatment of this kind. Of course I know one gets a very different impression when one sees the babies and the clinical results from that conveyed simply by a chart.

Dr. Holt.—What proportion of the cases you have treated in this way do these reports represent? Were there thirty or forty cases, and do these reports represent only the ones that were satisfactory? I quite agree with Dr. Talbot that we sometimes see similar results in cases not treated in this way. However, there is one of those cases in which the results seem very striking.

Dr. Freeman, in closing.—Concerning the human serum and the horse serum. The horse serum is not only more easily available but one can get it in any quantity. In the case, for instance that was given so many injections; if we had been dependent on human serum we would have had to stop the treatment it took such a quantity.

I do not think it makes any difference whether we use the human serum or the horse serum or whole blood.

As to the question Dr. Talbot raised with reference to the possibility of sensitizing these babies. It must be remembered that these were practically dying babies; we thought under these circumstances the possibility of sensitization was a minor question.

As to the cases themselves, two of them are not very striking, but in the second case the child had lost so much in weight and was in such bad condition that every one who saw it thought it would die. After the serum was injected the child became better and then we gave it more serum, and it finally recovered.

I am not at all sure myself that this treatment is worth a great deal but it certainly seemed worth enough to warrant bringing it before you to see what you think about it.

TWENTY-FOUR-HOUR METABOLISM OF TWO NORMAL INFANTS WITH SPECIAL REFERENCE TO THE TOTAL ENERGY REQUIREMENTS OF THE INFANTS.

Dr. Fritz B. Talbot, Boston.—This is a continuation of the series of investigations of the metabolism of normal infants begun five years ago by Benedict and the writer at the Nutrition Laboratory of the Carnegie Institution of Washington. The purpose of the present investigation was to determine if possible how much energy was expended in the ordinary muscular activity of an infant during a twenty-four-hour day. If the increase in metabolism due to muscular activity can be determined, if the factor of growth, and the factor of energy lost in the excretions be established, this material could be used in conjunction with the average curve of the basal metabolism to estimate the number of calories necessary in a twenty-four-hour day. One of these infants was in the respiratory chamber twenty-two hours and thirty-one minutes, and the other twenty-three hours and ten minutes. The length of the observation compares very favorably with those of Rubner and Heubner, which were in all instances shorter. Accurate records were kept of the time during which the infants were nursed, the time they cooed, kicked, played, smiled, were changed, and cried. In the observations on the first baby it was found that the "basal" metabolism of 285 calories was increased 143 calories by muscular activity. This corresponded with an increase of 67 per cent. The basal metabolism of the second baby was increased by muscular activity to an extent corresponding to 70 per cent. Since the infants were removed from the chamber at regular intervals during the twenty-four hours for their usual nursings, their metabolism could not be measured during that time but an estimate of what it would have been was considered justifiable. This estimate was made by taking the average maximum total metabolism, which in the second baby was 481 calories and dividing it by twenty-four hours which would give 20 calories, the amount produced in one hour. The baby was out of the chamber fifty minutes, so that 50/60 of 20 or 17 calories would be theoretically the amount excreted during the fifty minutes this baby was out of the chamber. This is added to the measured metabolism and gives the total calories *produced* in twenty-four hours. There were, however, other ways in which energy might be lost from the body such as the potential energy of the urine and feces. This energy which was lost must be supplied in the food. Presumably the greatest single factor to take into consideration was the fat lost in the feces, which with the urea in the urine should not exceed 15 per cent. of the total measured metabolism in a normal infant. A rough estimate of the caloric requirements of the normal infant might be made by adding the calories used up in muscular activity to the basal metabolism. If the infant was very quiet 15 per cent. should be added; if normally active 25 per cent. and if extremely active 40 more or less per cent. To the result 15 per cent. should be added for energy lost in the excreta and 20 per cent. for growth. In the case of the first baby (E. L.) we know how many calories were actually used up in muscular exercise. Therefore all that is necessary is to add the probable amount of calories necessary to allow for growth and what was lost in the excreta. If 35 per cent. is added to the 74 calories per kilogram of body weight actually used by this baby, it is found that she needs about 100 calories per kilo in the food. If the same process was followed out with the second baby the food requirement was found to be 94 calories per kilogram body weight. The writer makes the practical suggestion from these observations that it is probable that infants fed on cow's milk and particularly on formulas containing large amounts of protein, will require even more food than infants fed on human milk, because the "stimulating action of the protein" causes extra heat to be burned during digestion. The caloric requirements of normal infants obviously are not the same as for sick infants whose basal metabolism is higher per kilo of body weight; neither does it apply to the infant with a subnormal temperature indicating depressed vital functions. These infants come under another category and reguire further study to answer many of the points now obscure.

DISCUSSION.

Dr. Southworth.—I presume these babies were kept at the same temperature throughout the experiment.

Dr. Talbot.—Yes, they were kept at the same temperature all the while.

Dr. Southworth.—Have you made any calculations as to how much energy is used up in the changes in temperature to which babies' bodies are subjected, as when the lower extremities are exposed? I saw a child a few days ago that was not doing very well and the parents were dressing the child without shoes or stockings. I told them I thought the baby would do better if its feet and legs were covered and if it did not waste energy through a loss of heat that should go into growth. It has been estimated by a certain English writer that a certain number of ounces of additional nourishment must be given to provide for the loss of heat when certain portions of the body are unnecessarily exposed.

Dr. Dunn.—I would like to ask what evidence there is that there is such a thing as a normal infant? The factor of individual variation comes in to an enormous extent if one takes two, three, or five babies. In working out figures for metabolism and calories what evidence is there that they can be applied to other children where there may be a wide variation? Of course if the number of observations used to obtain the figures are many one may come out somewhere. Even if there is a great individual variation and we get enough figures we may arrive at a standard by averages, but that has always seemed to me the great mistake foreigners have made. If one takes a number of figures and then divides their sum by a number of cases the result is never applicable to any individual infant.

Dr. Godfrey R. Pisek, New York.—We should be very grateful to Dr. Talbot for this piece of work. I think, however, that the estimate is low for the amount of energy the child uses when out of the chamber, particularly the amount of energy used in nursing. I would like Dr. Talbot to speak of this point.

Dr. B. Raymond Hoobler, Detroit.—Dr. Talbot is to be congratulated on being able to make a metabolism observation covering twenty-three hours. This is something that has not been done before. Rübner has done better than anyone else thus far except Dr. Talbot and the best he could do was to get observations covering nineteen hours and some minutes. I think Dr. Talbot has approximated very nearly the real heat production of these babies. Rübner found 100 calories per kilo body weight the average requirement of an infant under six months of age. Dr. Talbot's estimate would just a little more than exceed 100 calories per kilo body weight so that this estimate must be very nearly the truth. I think we are finding that nearly all active children require more than 100 calories; we are finding the requirement running 110, 125, or even 130 per kilo body weight. The amounts that have been allowed for loss by the urine and feces have all been carefully estimated and he has also estimated the amount of fuel that would be required for the increment in growth. Also the matter of activity has been worked over very nicely. Dr. Talbot is to be congratulated on this very careful piece of work.

Dr. Fritz B. Talbot, in closing.—Some points have been left a little obscure as I did not read all of the paper. Perhaps I did not bring out clearly that we did not take the basal metabolism because the baby was not quiet all day. We wrote down just what the baby did and just when he did it. We then took the average of all the active periods and added the amount of heat used up by these activities.

In regard to the loss of heat from exposure—the surrounding temperature makes no difference in the amount of heat the baby produces unless there is chilling, and then when he shivers he produces heat. If he does not perform additional exercise he does not produce more heat. These figures may not be directly applicable to older children but they are applicable to new-born babies.

The new-born baby is sometimes given a water bath at the time of birth. This is all wrong. It may result in subnormal temperature and then there will be a lowered metabolic activity and all the vital functions will be derpessed. If the new-born baby is strong enough to shiver and cry, it then produces heat and is able to withstand the shock.

A point of importance with reference to muscular activity has been brought out in some work that Dr. Lush did in a boys' school in St. Pauls. These boys were very active and the number of calories they were eating was very carefully estimated. It was found that they were eating one and one-half times as much as a laboring man.

STUDIES ON BLOOD CALCIUM. THE CALCIUM PARTITION OF DISTRIBUTION IN OX BLOOD AND IN MAN'S BLOOD.

Dr. David Murray Cowie, Ann Arbor, Mich.—Because of a difference of opinion as to the distribution of calcium in the blood we planned and carried out the present investigation. The practical side of the question has to do with whether it is more expedient and more accurate to use serum or whole blood for the estimation of blood calcium. The argument naturally is in favor of methods which employ whole blood, but hitherto some considerable difficulty has been experienced in ashing, reducing or extracting calcium from whole blood. This we believe has been overcome by the method employed by one of us last year (Laws and Cowie), and still better by a method recently perfected by Lyman. The scope of our work has been to determine the calcium content of whole blood, of normal serum, of serum from defibrinated blood, the calcium content of the unwashed corpuscles obtained from defibrinated blood, of unwashed corpuscles obtained from citrated blood, of washed corpuscles obtained from defibrinated blood, of washed corpuscles obtained from citrated blood, the power of blood corpuscles to combine with calcium, and the character of the combination of calcium with blood corpuscles.

The present communication consists of a preliminary report on the calcium partition and distribution in ox blood and in man's blood. Our figures are given in milligrams calcium per 100 c.c. Our studies have not been completed for the washed and unwashed corpuscles from citrated blood and our final figures will be subject to slight changes. In making our calculations we had to consider the relative proportion of serum and formed elements in a given sample of blood. For instance, in ox's blood 32.55 per cent. of the whole blood is composed of formed elements (corpuscles) 67.45 of serum. In man's blood 51.302 per cent. is composed of formed elements, 48.698 per cent. serum. By calculation on this basis we find that the calcium content of whole blood is definitely greater than that of an aproportional amount of serum. So much so that one must admit that the corpuscles are not negligible. The calculated amounts of calcium in the serum and corpuscles, respectively of 100 c.c. of ox's blood and of man's blood show that the serum of ox's blood contains more calcium than the serum of man's blood; that the corpuscles and fibrin of man's blood contain more calcium than the corpuscles and fibrin of ox's blood, and that the whole blood of man contains more calcium than the whole ox's blood. The possibility of a variation in the relative proportion of corpuscles and serum under altered states of the organism must also be taken into consideration. There is more serum per volume of blood in severe anemia and in cases of hydremia. A study of the comparative calcium content of corpuscles and serum in altered blood states might be of considerable interest. The Lyman method is well adapted for either corpuscles or serum. With proper equipment and reliable chemicals the method is of clinical utility.

THE URIC ACID CONTENT OF THE BLOOD IN NEW-BORNS.

Dr. J. P. Sedgwick and Dr. F. B. Kingsbury, Minneapolis.—It has long been known that the uric acid excretion in the urine of children during the first few days of life is both relatively and absolutely high. It is also well known that during this period when the uric acid excretion is highest rapid morphlogical changes occur in the blood of the new-borns, as the disappearance of the nuclei of many of the red cells, the change in proportion from a predominating number of polymorphonuclear neutrophiles to a corresponding proponderance of lymphocytes, and the striking decrease in the leukocyte count of the peripheral blood. The polymorphonucleosis drops rapidly from the second to the fifth day. Nucleoproteins set free by the leukocyte destruction have been considered the source of the well-known high uric acid excretion of the first week. The purpose of the present investigation is to determine whether or not the high uric acid excretion during the first few days of life is accompanied by a simultaneous increase of this substance in the blood. Benedict's modification of the original Folin-Denis method for the determination of uric acid was tried, but found more tedious than the later modification of Myer's, Fine and Lough. The latter modification with certain minor changes was used throughout the work. The weights of blood samples used in these analyses varied from 9 to 18 grams and were drawn from the superior longitudinal sinus of the new-borns through a sterile hypodermic needle into a glass syringe and expelled into small weighing bottles containing 0.1 gram of potassium oxalate. The placental blood was collected as soon as possible after cutting the cord, which was done late, that is, after the cord had stopped pulsating. The maternal blood was drawn from the arm of the mother at the time of parturition. All the new-born subjects that served in this investigation were normal. We found the average values for sixteen determinations of the uric acid content of maternal and placental blood identical being about 3 miligrams per 100 miligrams blood, agreeing in this respect with the independent findings of Slemons. In some cases the infants were given water in addition to their ordinary diet of breast milk. It may be observed that the content of uric acid in the blood the first three or four days after birth is higher than that of the blood of the same new-born at birth. In seven cases there is a marked decrease in this value at the end of eight to eleven days from the value obtained three to eight days earlier. (In the same infant in each instance.) It was noted that in the period between the second and third days forty-eight to seventy-one hours that the value reached a maximum. During the first three or four days this value is higher than the maternal and placental figures. From a maximum of 3.9 milligrams, the blood uric acid falls off slowly to 2.9 milligrams on the fifth day and then rapidly to 1.6 milligrams by the eighth to the eleventh day. This value agrees with the 1.3 to 1.7 milligrams found by Liefmann in the blood of thriving children from nine weeks to fourteen months of age, on a pure milk diet. Our findings support those of Wells, Corper and others (in opposition to the results of Schittenhelm and Schmidt) that human fetal tissues possess no uricolytic power, for it would be difficult to imagine so great a production of uric acid if the tissues themselves possessed the power to destroy it. Whether the decomposition of nuclein material which must be looked upon as the cause of this uric acid increase in the blood is related to the striking changes in the blood cells, particularly in the partition of white corpuscles taking place at this time, or to nuclein destruction in other parts of the body as yet unknown, or to both, must be left to the future to decide. These results fit in well, however, as the connecting link in the theoretical chain of early leukocytosis, fall in leukocytosis, flood of uric acid in the blood, high uric acid excretion, and uric acid infarcts.

DISCUSSION.

DR. FRITZ B. TALBOT, Boston.—This is one of the very obscure periods of infancy. Dr. Sedgwick has given us material which I hope will open up the way to more investigations in the new-born, about which we know but little as yet.

Dr. Percival J. Eaton, Pittsburgh.—I believe you said that some of these babies were getting water and others were not. Did you notice a greater concentration of uric acid in the urine of those that were not getting water? This is of interest to me because in my locality some of the babies are not given any water until they are three months of age or older.

Dr. Sedgwick.—We did not make any examinations of the uric acid excreted in the urine but only of the uric acid content in the blood.

THE SALTS IN GREEN VEGETABLES AND THE EFFECT OF DIFFERENT MODES OF COOKING.

Dr. Frederic H. Bartlett, New York.—The addition of green vegetables to the dietary of young infants is becoming a common practice. It is believed that their value is due to the effect on the mineral metabolism. The secondary anemia of infants fed too long a time on an exclusive milk diet is easily explained by the small amount of iron in cow's milk. Instead of making use of drugs to supply the needed iron, green vegetables have been fed to many children in the wards and the out-patient department of the Babies' Hospital. The plan has been followed with children as young as six or seven months. Infants thus fed have shown an earlier closure of the fontanel and generally greater activity than those fed without such additions to their diet. This beneficial effect has been variously explained as due to the mere addition of an increased quantity of salts, to the particular combinations of the bases with the inorganic and organic acids present which provide the salts in an especially suitable form for use by the organism, and, that the value of the vegetables lies in a biological or so-called vitamine effect. The general opinion is that the mineral content is the important factor, and we have studied the subject from this viewpoint. We have studied the actual mineral content of the vegetables as ordinarily prepared and administered. It is obvious that the water used in cooking extracts more or less of the constituents and it is not a common practice to give this with the vegetables.

We undertook an analysis of cooked vegetables, considering separately the solid portion ordinarily given as food and the water used in cooking. We estimated the content in grams of solids of vegetables prepared by boiling, taking spinach, New Zealand spinach, young carrots, onions, string beans, asparagus and potatoes, and estimating the solids, ash, calcium, magnesium, phosphorus, potassium, sodium, sulphuric acid iron; also total nitrogen and nitrogen as protein. We estimated the percentage lost in water under ordinary boiling conditions, compared the percentages lost in the water with long and short boiling and compared the percentages lost in water by steaming and by boiling; the content in grams of vegetables prepared by steaming of the various constituents and the approximate content of one tablespoonful of steamed vegetable of the various constituents. Spinach shows the highest total salts, containing from two to three times as much ash as any of the other vegetables studied. The preponderance is largely due to calcium and phosphorus. The iron is highest in New Zealand spinach; ordinary spinach and carrots being next. The iron in onions is very low, while asparagus has only a trace. The table plainly shows that spinach is the most efficacious in supplying mineral salts. New Zealand spinach does not belong to the family of ordinary spinach. It possesses the advantage of being available for a continuous supply throughout the summer, while ordinary spinach is not so easily obtained. The analyses show an excessive waste of salts if the water in which the vegetable is boiled is discarded. It ranges from over a quarter of the total ash of onions to nearly three-quarters of that of New Zealand spinach. In the others the loss is about one-half the total. Calcium is the only constituent which is not affected. The examination of potatoes showed so small a loss of total solids that the analyses were not carried through. The saving of salts by shorter boiling was insignificant. The only exceptions to this were the calcium and chloride in the beans and the sulphate in spinach. Steaming was then tried, a rice steamer being used. The vegetables are held in a tightly covered receptacle with a rather finely perforated bottom. Any type of steamer which held the vegetables out of water would undoubtedly serve as well. Steaming was found to be the most economical method of cooking for preserving the salts. The remarkable saving of salts by this method should be emphasized. In spinach the loss by steaming was about one-half what it was by boiling. The effect of steaming on New Zealand spinach is more variable than in the case of other vegetables. Sodium is lost in a high degree even in steaming. There is a slightly greater loss of calcium by steaming than by boiling, but since the calcium loss is slight in any case, this is of little importance. One hundred grams of the edible portion of uncooked vegetable when cooked yields approximately three tablespoonfuls of all vegetables but carrots which yields about four. If a steamer is not available the steaming may be done in a double boiler, placing no additional water in the inner boiler. There is very little difference between this method and steaming, the difference, however, being in favor of steaming.

DISCUSSION.

DR. GODFREY R. PISEK, New York.—Many young children do not like vegetables. I would like to ask Dr. Bartlett how he gets the infants to eat the vegetables and whether he feeds the vegetables in a bottle.

DR. SEDGWICK.—We are very much indebted to Dr. Bartlett for calling our attention to this subject. It is one in which we have been interested. Josephine Barry, who is in the Department of Economics of the University of Minnesota, made a study of the retention of salts by different methods of cooking and showed the importance of retaining these salts. Infant metabolism experiments by F. B. Roder show the retention of calcium in the feeding of vegetable free diet and when vegetables were given to children. An interesting subject we have worked on was to find the amount of calcium necessary to produce a calcium retention. We found that an enormous amount was required and that the small amounts usually given therapeutically were simply a farce. We gave 5 grams in twenty-four hours during the first year and found that if we used 3 grams we did not get as good results. It takes twice as much calcium lactate as it does calcium chloride to get the same results. The results obtained by the McCrudden method, by which the amount of salts in the whole diet are taken instead of the individual parts, confirm the results obtained by Dr. Bartlett.

DR. L. EMMETT HOLT of New York.—Since vegetables are in the nature of a foreign substance in the intestinal tract of young infants careful attention should be paid to their minute subdivision. The difficulty caused by particles of undigested vegetables may be entirely prevented by rubbing the vegetables through a fine sieve. We are doing this in the hospital and it is surprising how little effect vegetables prepared in this way have upon the infant's stools. One point that cannot be too often emphasized is the mistake of allowing the baby to have the bottle for two years, as seems to be customary in some sections of the South. We meet with some of the worst types of malnutrition in such children.

DR. FRITZ B. TALBOT, Boston.—Have you made an analysis of Swiss chard which is a vegetable used considerably in Boston?

DR. PERCIVAL J. EATON, Pittsburgh.—I was going to ask the same question. I also wish to call attention to the fact that the water in which vegetables are cooked makes a good soup stock. Instead of discarding the water it may be kept and given in split pea or bean soups and thus the mineral salts will be conserved.

DR. ROLAND G. FREEMAN of New York.—It has been my experience that children with poor digestive capacity do not take vegetables well. I have used stewed lettuce and would like to know whether Dr. Bartlett has made any investigations with lettuce.

DR. PERCIVAL J. EATON.—I wish to emphasize what Dr. Holt has said with reference to sieving the vegetables. We have them all sieved until the children are old enough to be trusted to chew their food. If Dr. Freeman sees that this is done I think he will find that the children digest spinach well and if it is not done they do not digest it so well.

DR. ISAAC ABT of Chicago.—We are using a mill with two closely adjusted plates for pulverizing vegetables and other foods which does this work very effectually.

DR. HENRY HEIMAN of New York.—I have had somewhat the same experience as Dr. Freeman. I think we must not lose sight of the fact that we have unsplit carbohydrates as well as unsplit proteins. Our experience in New York has shown the necessity of giving babies vegetables as early as possible. This is not because the vegetables contain iron alone but for other contents which are required for the growth of bone and other tissues.

Dr. David M. Cowie, Ann Arbor.—We have had some trouble from attempting to use as much spinach as we did carrot. We do not get the cayenne appearance in the stools if we use only one tablespoonful of carrot.

Dr. Helmholz, Evanston, Ill.—An article has recently been published showing that vegetables dried, pulverized and made into the finest emulsion possible might be fed to infants two or three months old without any effect whatever on the bowels.

Dr. Bartlett, New York.—Dr. Holt has answered Dr. Pisek's question. If the vegetables are rubbed through a fine sieve they may be fed through a bottle or with a spoon. It is a mistake to begin feeding vegetables in as large an amount as a tablespoonful.

CONGENITAL SKIN DEFECTS.

Dr. Isaac Abt, Chicago.—So-called congenital skin defects have not been frequently reported in the literature. The majority of reports at hand deal with skin defects of the scalp, which vary in size from a pin point to a small coin. They are usually circular in shape, sometimes oval or irregular, and generally have clean-cut edges. Most writers attribute their cause to either errors in development, or to inflammatory adhesions between the external layers of the skin and the amnion. At the point where this adhesion has taken place, the growth of flat epithelium is retarded. As the liquor amnii accumulates the so-called Simonart's bands are formed. If these bands are torn loose from the integument of the fetus, a skin defect remains. Not infrequently these skin defects are associated with other congenital malformations such as deficient fingers, hands or feet, caused by the action of the amniotic bands. Though these lesions are found most frequently on the scalp Emanuel reports a case with congenital skin lesions occurring on hands, legs and feet, over the temples and the bridge of the nose, and also an area in the middle of the lumbar region. These defects seem to bear no relation to trauma at birth and undoubtedly originate *in utero*. Occurring singly or in groups they present ulcerated areas which affect both layers of the skin. The subcutaneous tissues are not involved. The ulcerated areas are sharply defined, somewhat irregular in outline; the base of the ulcer is red and secretes a thin lymph. In some of the recorded cases the defective skin areas developed hairs later in life. Microscopically the area under examination shows the lack of epithelial structures, smooth muscle and adipose tissue. The skin glands develop, if at all, in a rudimentary manner. The condition has been referred to as a congenital atrophy of the skin, but this can hardly apply, for the reason that atrophy implies degeneration, and no degenerative process is discernible. The majority of these lesions tend to cicatrize in a short time.

The case which forms the subject of this report was a newly born infant referred to me from the Chicago Lying-In Dispensary. The parents were normal, the labor was normal, and the infant was normal at the time of birth, except for two defective skin areas over both knees. These areas were about 1¼ inches in diameter, symmetrical, and seemed to be, so to speak, irregularly punched out. The skin around the edges was drawn and puckered, presenting the appearance of ulcers. The base was beefy red and moist. A few small areas of this red ulcerated surface showed a yellow exudate. A whitish scar seemed to cross the ulcerated area as though connective tissue bands indicated the beginning of a process of cicatrization. The ulcers from week to week became more and more cicatrized, and after five or six weeks were replaced by shiny white patches, somewhat lighter in color than the surrounding skin, though the healing process was apparently complete so far as the external healing appearances were concerned. A review of the cases reported in the literature is appended giving the sex, age, localization of the lesion and other data.

DISCUSSION.

Dr. Julius P. Sedgwick of Minneapolis.—We had last winter one case of congenital defect of the scalp. I am sure we should see more of these cases if the new-born infants were turned over to the pediatrist. These cases are possibly overlooked by the obstetrician.

ENLARGEMENT OF THE THYMUS TREATED BY THE *x*-RAY.

Dr. Alfred Friedländer, Cincinnati.—The purpose of this paper is to emphasize that: 1. Enlarged thymus is much commoner than is ordinarily supposed. 2. The diagnosis can be made definitely by means of simple physical examination and the *x*-ray. 3. In the *x*-ray we possess a therapeutic agent which in and of itself, will effect a cure in the vast majority of cases. While very little is known about the etiology of enlarged thymus, certain facts have come to light in our studies. Quite a number of our cases have occurred in babies suffering from congenital syphilis. At present no conclusions can be drawn from those observations. A distinct familial tendency has also been noted. In our recent cases four families had more than one child affected. Two pairs of twins came under our observation, all four having enlarged thymus. We have also noted an apparent relationship of hypertrophic stenosis of the pylorus and enlarged thymus. It should be borne in mind that some cases of enlarged thymus run a symptomless course. These latent cases are discovered only as the result of careful routine examination. Sudden death as the result of trauma, anesthesia, or intercurrent affection occurs not infrequently in these cases. In fact intercurrent affections frequently light up pressure effect of an enlarged thymus hitherto unsuspected.

There are three definite symptoms of enlarged thymus which are present singly or together; namely, dyspnea continuous or remittent, suffocation attacks with cyanosis, and stridor. The dyspnea may be either permanent or intermittent. In the intermittent forms, children apparently quite normal are siezed with suffocative attacks, accompanied with cyanosis, usually associated with convulsive movements of the extremities, followed after a few moments to return to an apparently normal state. The intervals between the attacks, at first considerable, tend to become shorter. Stridor when present is usually inspiratory.

The diagnostic physical signs of greatest importance are detection of a bulging mass in the jugular (more often absent than present) and enlargement of the area of normal thymus dulness on percussion. In young children there is a definite form of thymus dulness in the shape of an irregular triangle or truncated cone whose base is the sternoclavicular junction and whose apex is the second rib. Laterally the dulness extends but little beyond the sternum. The percussion of the area of thymic dulness is not difficult if one uses very light, or at times threshhold percussion. Dr. Sidney Lange of Cincinnati has worked out a very careful technic by which definite information as to the existence of thymus enlargement is afforded by the *x*-ray. The child must be absolutely flat on his back, with absolutely no lateral tilting, and the exposure must be absolutely instantaneous. In the series presented the time of exposure varied from one-sixtieth to one-thirtieth of a second. A very soft *x*-ray tube should be used. In our work there has been no difficulty indifferentiating enlarged thymus radiograms from those of congential heart lesions, or caseous lymph nodes.

The treatment of enlarged thymus is in reality remarkably simple. The results of thymectomy may aptly be summarized by one of its advocates, Parker, who says "Of fifty patients operated upon, seventeen died, a mortality of 33⅓ per cent. In the *x*-ray we have a therapeutic agent at once safe and remarkable efficacious. Our series now exceeds 100 cases with four deaths."

The technic as worked out by Lange is as follows: A Coolidge tube, backing up a 9½-inch spark, was employed. The rays were filtered through 4 millimeters of aluminum and a piece of thick leather. The target skin distance was approximately 9 inches. The routine exposure was 25 milliampere minutes. In mild cases a single dose given over the anterior surface of the chest proved sufficient. In more urgent cases 50 milliampere minutes were administered at the first treatment, twenty-five anteriorly and twenty-five posteriorly. During the treatment the child was kept quiet by four sandbags one placed across each arm and each leg. The interval between treatment was usually one week, unless urgent symptoms suggested the advisability of more frequent treatments. In order to get the results it is essential that the treatments be comparatively heavy and that they be repeated at sufficiently short intervals. To guard against sudden death before the full destructive effect of the *x*-ray upon the thymus has been elicited, all cases with urgent symptoms should be kept under close observation and the *x*-ray treatments pushed boldly. In the average case improvements of symptoms has been noted within twenty-four to forty-eight hours after the *x*-ray treatments. The plates are shown in pairs before and after treatment; in many a very decided improvement is noted in two weeks time or even less.

DISCUSSION.

Dr. Howard C. Carpenter, Philadelphia.—Dr. Pfahler of Philadelphia has treated this type of cases with uniformly successful results. In a few cases almost instantaneous improvement has followed the treatment. He tells me that there is some doubt as to whether the thymus is enlarged if it cannot be definitely proven that it is the thymus causing the symptoms. There may, however, be some cases in which the thymus is really enlarged in which this is not shown by the *x*-ray.

Dr William Palmer Lucas, San Francisco.—I have found practically the same type of picture in children without any clinical symptoms, and I have followed the children for months without any symptoms arising In cases with enlarged thymus and symptoms I have obtained the same results with the *x*-ray treatment, in practically the same dosage as Dr Friedländer has described. But I have not obtained such results in two weeks

Dr. Fritz B. Talbot, Boston.—I have had practically the same results as Dr. Lucas. Many times we cannot see whether we have a pathological enlargement of the thymus with the *x*-ray. In cases in which the thymus was enlarged we have been seeing the same improvement under the *x*-ray treatment that has been described, but I cannot say what the dosage has been. We had one case four or five years ago in which the symptoms disappeared just as in Dr. Friedländer's cases, but last spring they returned and required a long course of treatment.

Dr. David M. Cowie, Ann Arbor.—I have had children sent up from the *x*-ray room with the report that there was an enlarged thymus in which we could not confirm that diagnosis; then again we have had typical cases of thymus enlargement which were not shown by the *x*-ray.

Dr. Samuel McC. Hamill, Philadelphia.—Has anyone had cases of thymus enlargement *x*-rayed several times without any treatment being given? I have had cases with the diagnosis of thymic enlargement sent up from the *x*-ray room to which I did not pay much attention, but I finally decided to follow up such a case and I kept the child in the ward two weeks. We then had another *x*-ray picture taken and this showed no shadow. I have wondered whether the exposure to the *x*-ray in taking the picture could have had a therapeutic effect on the thymus.

Dr. Heiman, New York.—We have been able to confirm the *x*-ray examination by physical diagnosis by placing the patient in the erect position and then having him bend forward.

Dr. J. P. Crozer Griffith, Philadelphia.—I believe there is such a thing as thymic asthma and that death occurs from it. I have seen this condition steadily disappear under *x*-ray treatment. It is true we may have enlarged thymus without any symptoms and yet have the children die from it. Thymic enlargement is an accompaniment of status lymphaticus, and the symptoms and results that we see are due to pressure and not to the thymus gland alone.

Dr. Alfred F. Hess, New York.—It seems possible that the same picture that is produced by thymic enlargement may also be produced by an enlargement of the vessels at the base of the heart. This picture is sometimes seen in children with scurvy and in adults with beriberi. In these conditions the enlargement disappears with the disappearance of the disease. In taking *x*-ray pictures of babies, some of the controls gave pictures just like those of thymic asthma and yet no symptoms of thymic asthma were present. It would seem that these shadows may be found most unexpectedly in apparently normal babies.

Dr. J. H. M. Knox, Baltimore.—Our *x*-ray operator is very skeptical as to whether we can detect thymic asthma either by the *x*-ray or by physical examination.

Dr. F. S. Churchill, Chicago.—How long have your cases been under observation? It would be interesting to know the longest and the shortest time that you have kept these cases under observation.

Dr. Alfred Friedländer, Cincinnati.—Some cases of enlarged thymus may give no symptoms; others may produce pressure effects or may produce the symptoms of hyperthymus. Some of these cases may be exceedingly threatening and may result in death. Therefore when we hear that a case runs a symptomless course that is no reason for not reducing the size of the thymus. We all know that cases of enlarged thymus do get along without treatment, but the thymus is an organ which enlarges and diminishes very rapidly, and the facts that there are no symptoms is no reason for stopping *x*-ray treatment. We have studied a large series of cases and have found that where there is an enlarged thymus, if marked congestion occurs as from whooping-cough or bronchitis, it may light up the symptoms and cause the death of the child.

If we get a picture of this type and suspect that it may be due to enlarged vessels at the base of the heart, we give two or three *x*-ray treatments and then take the picture again; if they are enlarged thymus cases there will then be no resemblance to the picture of enlarged vessels.

The point to be emphasized in taking these pictures is that the child must be held flat and the picture must be instantaneous. The time occupied in taking the picture must not be over a small fraction of a second; ordinary pictures will not show an enlarged thymus.

The first case was treated in 1903 and is now hale and hearty. The most recent case was treated one week ago. Some of these cases go back to 1903 and some are very recent.

FOCAL LESIONS PRODUCED IN THE RABBIT BY COLON BACILLI ISOLATED FROM PYELITIS CASES.

Henry F. Helmholz and Miss Carol Beever, Evanston, Ill.—The mode of infection in pyelocystitis in the infant and child is still far from settled. We have endeavored therefore to determine whether or not pyelocystitis could be produced by the hematogenous route. In the first series of sixty-six rabbits, eight different strains of coli bacilli were injected intravenously; of these twenty-six showed focal lesions of one kind or another. The organs affected were as follows: kidneys, 11 times, cecum 7 times, gall-bladder 7 times, appendix 5 times, stomach 4 times; in addition there were single instances of hemorrhagic infraction of the descending colon, ulcerative colitis, hemorrhagic enteritis, and duodenal hemorrhage. Of the kidney lesions, three were hemorrhages of slight extent. The remaining eight animals showed the following kidney lesions: three cortical abscesses, three medullary abscesses, and two with unilateral pyelitis. Of the animals injected only two showed a typical pyelitis, and in both instances the pyelitis was unilateral. These two cases emphasize the fact that unilateral pyelitis does not necessarily point toward the lymphatic mode of infection but that bacteria may lodge in one kidney and grow and not in the other even when larger doses are given than could be conceived of in human pathology.

A second series consisting of eleven animals were injected with a mixed culture of pneumococci and colon bacilli isolated from a severe case of bronchitis and pyelitis in which on catheterization only a glass catheter full of practically pure pus could be obtained just before death. Of the eleven animals injected, six showed focal lesions of the kidney, three had a pyelitis, one had cortical abscess, and two had diffuse hemorrhages in the cortex. An analysis of the three cases having pyelitis again emphasizes the difficulty of a study of pyelitis. The first two would have been overlooked if sections had not been studied and it is readily conceivable that a section taken in another portion of the kidney would not have shown these changes. As controls to these experiments, four different strains of colon bacilli isolated from the intestinal tract of infants suffering from slight intestinal disturbances were injected. Three animals were injected with each strain. Of the twelve injected only one animal showed any local findings. This was a purulent appendicitis. The urinary examination in all the animals was entirely negative. The result of these experiments were a considerable surprise; we had anticipated a much larger number of takes in the kidney than were obtained. The most characteristic lesion of the colon bacilli appeared to be the edematous infiltration of the cecum. It would seem that the rabbit in almost 90 per cent. of instances can excrete colon bacilli through the kidney without any harm to the kidney. A comparison of this with the results obtained by injecting a mixture of pneumococci and colon bacilli, showed that the kidney is more frequently affected, in six out of eleven rabbits, or 60 per cent., the mixture caused definite lesions in the kidney. This increase of focal lesions corresponds closely to the difference in appendiceal localization, described by Rosenow, when a mixture of colon bacilli and streptococci were injected. The question naturally arises whether in human pyelitis there is frequently a double infection. The second organism may be easily overlooked, because cultures are not made easily when both organisms are present, and if present the colon bacilli would tend to overgrow the other.

In conclusion, it is possible to produce typical pyelitis in the rabbit by the intravenous injection of colon bacilli isolated from human cases. If a mixture of organisms is injected the relative number of kidney infections can be greatly increased.

DISCUSSION.

Dr. Charles Hunter Dunn, Boston.—I have been much interested in the question of the route of infection in pyelocystitis. A case recently occurred in which a baby had an empyema and aspiration of the chest showed a pure pneumococcus infection. A blood culture was taken and this showed no pneumococcus but a pure culture of colon bacilli. Two days later the child developed a typical pyelocystitis. Formerly I did not favor the hematogenous theory of infection in pyelocystitis, but I am now coming to believe in it.

Dr. William Palmer Lucas, San Francisco.—We have been following Dr. Helmholz's work and one of my house officers has repeated these experiments. Our results have been practically the same as those of Dr. Helmholz. From our knowledge we seem to be warranted in thinking that there is no definite localization in the kidney but a general infection by which any organ may be infected. In 100 cases of pyelocystitis we have found seven instances of staphylococcus infection and three instances of streptococcus infection mixed with other organisms, but not pure cultures.

Dr. Henry Heiman, New York.—If you accept the theory that pyelocystitis is a hematogenous infection involving the gall-bladder or other organs as well as the kidneys and that the colon bacilli is the predominating organism, then you have a problem to solve. It would seem that the pelvis of the kidney is more readily infected through the urethra. Of the cases in which the pelvis of the kidney is involved, 75 per cent. occur in girls, in whom infection through the urethra occurs more readily than in boys.

Dr. Helmholz.—I have been very much interested in the case Dr. Dunn has reported in which the blood culture showed the colon bacillus and which developed pyelocystitis. It has been my experience that if there have been other organisms present that may possibly have caused the pyelocystitis, one may not find them but usually finds a member of the colon group, because the colon bacilli have a tendency to overgrow other bacilli.

Because we have a case in which the kidney infection is of hematogenous origin, it is not necessary to assume that all cases in which infection gets to the kidney must necessarily come through that route. Personally, I believe there is no reason to think that the kidney cannot be infected in a number of ways.

BRIEF OF CURRENT LITERATURE

DISEASES OF CHILDREN

Diphtheria Carriers.—In a group of eighty diphtheria carriers studied by S. Rabinoff (*Jour. A. M. A.*, 1916, lxvii, 1722) it was found that a certain number became negative, irrespective of the treatment employed. No better results were obtained with iodized phenol or with fullers' earth, than with the silver preparations or other antiseptics. Indeed, those cases which were not treated in any way did equally well. An exception must be made only as regards the results obtained with fullers' earth in adults, which were fairly satisfactory. The real problem of the carrier lies in the ultimate group in which the bacteria persist in spite of all local treatment. The presence of a foreign body in the nose may provide a favorable environment for the growth of the diphtheria bacilli. Removal of tonsils and adenoids seems to offer a safe and rapid method of eliminating diphtheria bacilli from the nose and throat of carriers, and should finally be resorted to where other methods have failed.

Exstrophy of the Bladder.—A. R. Stevens (*Surg., Gyn. and Obst.*, 1916, xxiii, 702) reports a successful operation for this condition by implantation of the ureters into the rectum. The patient was in good condition five years after the operation. A careful examination of the condition of the kidneys should be made before attempting this operation. As many of the successful cases have given clinical evidence of temporary renal infection in the first few days after operation, it would probably be safer to transplant the ureters one at a time with an interval of several weeks. The writer has found no report of a case of double ureterointestinal transplantation living over five years after any operations other than those which retain the ureterovesical orifice, but there are at least twenty-seven such (including the author's case) following the Maydl and Bergenhem methods and their modifications, and one is well seventeen years after a Maydl operation.

Treatment of Nocturnal Enuresis by Suggestion.—F. L. Dunham (*Amer. Jour. Dis. Child.*, 1916, xii, 618) regards uncomplicated nocturnal enuresis as an element in the psychic regression of an unstable organism toward a more primitive biologic state. The mechanism concerned in inhibition is an unconditional reflex which through social evolution becomes a conditional reflex. The object of treatment is to assist normal development in the associative mechanism, tending thus to induce a conditional reflex. The means employed are the presentation of a series of associative visual stimuli. A set of four simple associative sentences is printed on a card. Those used by the writer were: I am not going to wet the bed.

I am going to wake up at midnight. I shall get up and pass water. I shall not wet the bed any more. This is to be repeated ten times, twice a day, preferably during the act of urination, and at bedtime just before going to sleep. The card is then put under the child's pillow. This method, combined with no other measure, was employed in treating ten patients whose cases are reported. Under treatment for four months cessation of the habit was essentially complete in all but one case whose low mental level explains his irresponsibility and lack of success. For several weeks one girl was nightly aroused from sleep by her mother and urged to micturate; rarely would she awaken so thoroughly as to recall the incident the following day. The result was negative, bed-wetting generally occurring as before, but later in the night. This illustrates the part played by consciousness in a successful reaction. The child must assume the responsibility of waking up and caring for himself.

Topography of Pulmonary Fissures and Lobes in Infants.—From directions of the formaldehyde-hardened bodies of fourteen infants, varying in age from six weeks to fifteen months. J. C. Gittings, G. Fetterolf, and A. G. Mitchell (*Amer. Jour. Dis. Child.*, 1916, xii, 579) conclude that the fissures of the lung in infancy show practically the same relation to the bony framework of the chest as in adults. The origin, course and termination of the fissures vary greatly in different individuals. The variations apparently do not depend on any of the anatomic characteristics of the chest and cannot be predicted therefrom. The lower level of the lungs in infants and probably in young children does not extend quite so low as in adults. For this reason, and owing to the anatomic characteristics of the bases of the pleural cavities in early life, great care should be exercised to avoid damage to the diaphragm in performing thoracentesis. The sixth interspace in the midthoracic line and the seventh or possibly the eighth interspace in the line of the angle of the scapula (at rest) represents the lowest limits of absolute safety for thoracentesis in early life.

Obstetric Paralysis.—J. W. Sever (*Amer. Jour. Dis. Child.*, 1916, xii, 541) says that obstetric paralysis is due to a stretching or tearing of the cervical roots of the plexus brachialis. It occurs in boys as frequently as in girls. It occurs more often on the right than on the left side. The upper arm type is much more frequent than the lower arm type. It affects both arms very infrequently. It is practically always associated with a difficult labor, in which ether and forceps have been used and force has been applied. Not uncommonly is the baby asphyxiated. Head presentations show the larger percentage of occurrences of both types of cases. It may rarely be associated with fracture of the clavicle, but is not the result of a fractured humerus or a dislocated shoulder-joint. The prognosis for a useful arm is good in the upper arm type and bad in the lower arm type.

Experimental Scurvy Produced in Guinea-pigs by Milk and Milk Products.—J. J. Moore and L. Jackson (*Jour. A. M. A.*, 1916, lxvii, 1931) produced scurvy in guinea-pigs by the exclusive diet of raw cow's milk. Pasteurized, boiled and skimmed cow's milk will cause a similar condition. A severe form of the disease was produced in these animals by condensed milk, casein and water, and several proprietary infant foods. Raw cow's milk when added to oats was not found capable of preventing the onset of scurvy. In a few animals scurvy developed when milk was added to a general diet of green vegetables. The onset of symptoms in the individual animal is a very variable factor, some having a marked resistance, and others succumbing more rapidly. The older animals are more resistant. From a comparison of these results which those of investigators using other animal species, it appears that a ration which may be entirely adequate in nutritive value for one species may be inadequate for another. While there is a marked individual variation toward diets in each species, the species variation is still greater.

Pyloric Stenosis in Infants.—Sixteen cases of pyloric stenosis are reported by W. E. Gallie and L. B. Robertson (*Can. Med. Assoc. Jour.*, 1917, vii, 1) as having been treated in the Hospital for Sick Children, Toronto, by the Webber-Rammstedt method. This is a longitudinal incision down to the external surface of the pyloric mucous membrane extending the entire length of the indurated area, with separation of the muscular layer from the mucosa by blunt dissection until the mucosa is exposed for a width of one-eighth of an inch or more and bulges freely into the incision. After careful hemostasis the abdomen is closed. Of the sixteen cases, eleven recovered, a mortality of 31.2 per cent. Of the five fatal cases, one died of hemorrhage; one died sixty hours after operation with no relief of the symptoms because of incomplete operation; a third case which died three days after operation was a very desperate case on admission, there having been absolute constipation for five days and vomiting of all the food; the fourth case was a prostrated premature baby which had practically no chance from the beginning. It died about twelve hours after operation. Autopsy showed hypostatic congestion of the lungs, nephritis and colitis. The fifth died three days after operation in spite of the relief of vomiting, of general weakness. Of the eleven cases which recovered, two died subsequently, of other conditions, and autopsies were obtained. The first died six weeks after the operation, of acute enterocolitis. All the symptoms of pyloric stenosis were relieved by the operation and the case was a favorable one for complete recovery until the intestinal infection developed. The peritoneum was fully healed over the incision and no evidence of the incision was to be seen. The histological specimen shows that after the operation the peritoneal edges of the incision opened out widely and that the peritoneum grew over the edges and down into the incision to meet on the exposed mucosa. Separating the lumen of the bowel from the peritoneal cavity at this point is the mucous membrane, the submucous areolar tissue, the muscularis mucosæ which evidently escaped the scalpel, a small quantity of white fibrous tissue and the peritoneum. Whether this permanent weakening of the wall of the intestine will have any late effects, time alone will tell.

Milk-borne Infection in the Transmission of Human Communicable Diseases.—E. R. Kelley (*Jour. A. M. A.*, 1916, lxvii, 1997) says that Massachusetts experience would seem to indicate that even in raw milk supplies, with widely varying conditions of supervision, diphtheria transmission through milk is so rare an occurrence as to be negligible. The transmission of scarlet fever through milk, while much more common than diphtheria, is of very small percentage significance. Typhoid fever in this large series, extending over a period of years, was reasonably attributed to milk infection in a much larger number of cases than diphtheria or scarlet fever, but these amounted in all to only 5 per cent. of the total cases of typhoid reported. Septic sore throat is par excellence the milk-borne disease, but its occurrence is fortunately relatively rare. When it does occur, it is nearly always in epidemic form and is of more serious consequences. In all probability, the menace of tuberculosis is the best justification that we have for the supervision and control of milk supplies, so far as such supervision aims at the suppression of communicable diseases.

Phenol Excretion in the Urine of Infants, Including the New-born.—C. U. Moore (*Amer. Jour. Dis. Child.*, 1917, xiii, 15) finds that an increase in the number of stools per day is associated with a decrease in the total phenol output. In the writer's series of fifteen infants the phenol excretion per kilogram of body weight was less in the breast-fed than in the artificially fed infant. In infants and in adults, so far as it is possible to determine from the limited number of cases now at hand, there is an interrelation between the total phenol excretion and the protein intake as measured by the total nitrogen excreted in the urine. This relation can be expressed in the general term, *trebling the protein intake doubles the phenol excretion.* Contrary to the earlier findings, phenol is quantitatively present in the urine of every new-born infant, the average of these nineteen cases being 11.2 mg. for the first three days of life. As phenol is present during this period of starvation, it must orginate in part through endogenous metabolism.

Excretion of Sodium Chloride Injected Subcutaneously.—The studies of L. E. Holt, A. M. Courtney and H. L. Fales (*Amer. Jour. Dis. Child.*, 1917, xiii, 73) have shown that in acute diarrhea much salt and water are lost from the body. A similar condition is seen in marasmus, and after protracted vomiting, etc. When saline solutions are injected in such subjects a considerable amount of the salt is usually held for two or three days, and occasionally for a longer period. If in these infants the variations in the loss of water by the skin and lungs can be ignored, the retention of water usually follows closely that of the salt. The writers' metabolism studies support the clinical conclusions as to the beneficial effects of repeated saline injections in the conditions mentioned. With normal children and with convalescents without evidencce of dehydration, great variation is observed in the excretion of the injected water. It may be excreted very rapidly in the course of the first twenty-four hours, or part or all of it may be held for several days. The salt, however, is usually excreted rapidly, sometimes a large part of it in the first six hours.

Chemistry of the Spinal Fluid of Children.—Chemical examination by J. S. Leopold and A. Bernhard (*Amer. Jour. Dis. Child.*, 1917, xiii, 34) of the spinal fluid in ten normal cases in children gave the following results: The total nonprotein nitrogen varied between 17 and 26 mg. per 100 c.c. of fluid, the average being 21 mg.; the urea nitrogen varied between 7 and 13.5 mg., the average being 9.9 mg.; the creatinin varied between 0.7 and 1.5 mg., the average being 0.9 mg. In no case was there enough uric acid present in the spinal fluid to give a positive quantitative test. The sugar content varied within very narrow limits (0.07 and 0.1 per cent.), the average being 0.07 per cent. The figures for the nonprotein nitrogenous constituents and the sugar content were lower in the spinal fluid than in the blood in normal children. The concentration of total nonprotein nitrogen in the spinal fluid averaged 75 per cent. of that in the blood, the urea 82 per cent. of that in the blood and the creatinin 60 per cent. of that in the blood. The chemical examination of the spinal fluids from diseased children showed the following conditions: In chorea the chemical examination of the spinal fluid for its nonprotein nitrogenous constituents gave results closely paralleling those obtained in normal children. 2. Chemical examination in cases of idiocy, syphilis, epilepsy, and enuresis gave similar results. 3. In acute nephritis without uremic symptoms the total nonprotein nitrogen was slightly increased and uric acid was present in small amounts. In acute nephritis with uremic symptoms the total nonprotein nitrogen, urea and creatinin were markedly increased and uric acid was present in slight amounts. The sugar content was also increased. The figures obtained in the analysis of the spinal fluid were lower than those from the blood. 4. In serous meningitis the nonprotein nitrogenous constituents, as well as the sugar content were within normal limits. In tuberculous meningitis the total nonprotein nitrogen and the urea were normal, but the creatinin was slightly increased. Uric acid was present in every case, but the sugar content was normal or slightly reduced. In cerebrospinal meningitis the nonprotein nitrogenous constituents were normal, but the sugar content was reduced. In a fatal case of meningitis in which the streptococcus was found, the nonprotein nitrogenous constituents were normal and sugar was absent. 5. In the early stages of infantile paralysis the nonprotein nitrogenous constituents, as well as the sugar content, were within normal limits.

Infantile Scurvy: Therapeutic Value of Yeast and of Wheat Embryo.—As it had been shown that a clinical similarity exists between beriberi and infantile scurvy, it seemed to A. F. Hess (*Amer. Jour. Dis. Child.*, 1917, xiii, 98) as if yeast, which is a specific in the former disease, might also prove to be a potent antiscorbutic. Clinical experience did not substantiate the analogy, but demonstrated that this substance is of no value in scurvy either as a prophylactic or as a curative dietetic agent. It was found, however, to possess virtue as a stimulant to growth, when added to the milk in the form of the fluid autolyzed yeast or given to older infants as a desiccated powder. The embryo or germ of the wheat seed is another effective therapeutic agent in the cure of beriberi or in avian polyneuritis. Accordingly, this was also tested clinically for its antiscorbutic power; for this purpose a cereal and a watery extract of the germ meal were prepared. These preparations manifested some value as antiscorbutics, but not sufficient to render them useful in this connection from a practical or clinical standpoint. The watery extract, which is readily prepared, was found to stimulate growth, and may be used to advantage, on account of this quality, as a substitute for barley in milk preparations. It was furthermore noted that there is an idiosyncrasy as to the reaction to well-established antiscorbutics; for example, in some instances orange juice may meet with only partial success while potato produces a rapid cure.

Subacute and Latent Infantile Scurvy.—A. F. Hess (*Jour. A. M. A.*, 1917, lxviii, 235) holds that probably a large proportion of infantile scurvy is occasioned at present by pasteurized milk. This scurvy is usually not of the classic, florid type. It is less pronounced and obvious, and is consequently least often recognized. This type may be termed "subacute infantile scurvy" and is distinguished by incompletely developed symptoms which disappear quickly when orange juice or other specific therapy is given. Another type occasioned by this milk is "latent scurvy." This constitutes a state of malnutrition which develops slowly as the result of a negative balance of "vitamins." It can rarely be definitely diagnosed, except by the sharp recession of symptoms—stationary weight, pallor, poor appetite, etc.—following the administration of an antiscorbutic. We should no longer regard infantile scurvy as a disorder affecting merely the blood-vessels and the bones. Röntgenograms show that the heart, especially the right heart, is frequently enlarged, and that there is a broadening of the shadow at the base of the heart, at the site of the great vessels. Furthermore, this disorder is associated frequently, even in the mild forms, with a cardiorespiratory disturbance characterized by a very rapid pulse, and respirations which may rise as high as 60 a minute (polypnea). Both of these signs disappear promptly when orange juice or potato is given. This cardiorespiratory syndrome is due to an involvement of the nerves. Considered in conjunction with changes of the optic disc and increase of the knee reflexes, it is evident that the nervous system is extensively involved in infantile scurvy.

Astragalectomy in Infantile Paralysis.—During the past six years W. R. Mac Ausland (*Jour. A. M. A.*, 1917, lxviii, 259) has used astragalectomy as devised by Royal Whitman in almost all of the deficiencies following infantile paralysis affecting the leg. In his series of 135 cases the results have been so good that he rarely employs other procedures. Astragalectomy can be done at any age following a period of two years after the original paralysis, but if possible should be reserved until the child is six or eight years old. If, however, deformity is not being prevented by apparatus and if the limp is more than the extent of the paralysis warrants, the writer would not wait for this age. In the period between six and sixteen years of age the most satisfactory results are obtainable. Probably the most striking results follow its use in the deformity of calcaneovalgus, for which it was originally planned, but it gives excellent results in all foot conditions—even where only one muscle is paralyzed.

Production of an Antipoliomyelitic Serum.—J. W. Nuzunc (*Jour. A. M. A.*, 1917, lxviii, 24) reports protective experiments on monkeys and rabbits. He says that by the process of animal immunization with the organisms regularly isolated from the spinal fluids and the central nervous system of human poliomyelitic patients, an antiserum can be produced. Its therapeutic limitations are as yet unknown. Antiserum prepared in this manner contains agglutinins, opsonins and complement fixation bodies, as well as exhibiting certain antibactericidal properties. It would seem fair to conclude that with potent polyvalent antiserum prepared in this manner, some definite therapeutic value might be anticipated in human cases of the disease.

Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders.—S. J. Crowe, S. S. Watkins and A. S. Rothholz (*Bull. Johns Hopk. Hosp.*, 1917, xxviii, 1) present a study of 1000 tonsillectomies at the Johns Hopkins Hospital in which the tonsils and adenoids have been examined histologically. The indications for tonsillectomy are: 1. Local disorders in the upper air passages. These include hyperplasia of the tonsils causing difficulty in swallowing, articulation or breathing; frequent tonsillitis or quinsy; chronic laryngitis or bronchitis; chronic catarrhal or suppurative otitis media or Eustachian tube affection; chronic diphtheria carriers; the various "reflex neuroses" in children, such as asthma, paroxysmal nocturnal attacks of coughing, enuresis nocturna, and sometimes convulsive seizures resembling petit mal; new growths. 2. Local trouble in the cervical glands draining the tonsils. This may be either simple hyperplasia of the glands at the angle of the jaw or tuberculous cervical adenitis. 3. General systemic disorders secondary to a focus of infection in the tonsils, including infectious arthritis in which the periarticular changes predominate; myalgia or myositis; the early stages of a glomerulonephritis; symptoms designated as neurasthenia; occasionally an iritis refractory to all treatment and the rare conditions in which the chief symptoms are septic temperature; leucocytosis; general muscular and joint pains; general intoxication with negative findings on physical examination except for large, succulent tonsils. 4. As a prophylactic measure in chorea, acute rheumatic fever and heart lesions and in cases of chronic nephritis and arteriosclerosis that give a history of repeated attacks of tonsillitis. There are several contraindications for tonsillectomy. A tonsillectomy should never be undertaken during the acute stage. It is best to wait at least three weeks after all symptoms have subsided. Diabetes is a contraindication as the operation requires general anesthesia. A tonsillectomy is rarely of any benefit in the chronic deforming types of arthritis. In the majority of these cases it probably does more harm than good. There is nothing to be gained from a tonsillectomy during the acute stage of chorea, acute rheumatic fever or endocarditis. As a general rule, the tonsils should not be removed in children up to fifteen years of age solely because they are enlarged or detritus as seen in the crypts. In all of these cases the adenoids are also enlarged and should be removed. It must be remembered that there is normally a hyperplasia of the tonsils and adenoids during childhood; also that the probable function of this lymphoid tissue is to protect the lower air passages. Even frequent attacks of tonsillitis do not necessarily mean that the child's tonsils should be removed; often removal of adenoids, regulation of the digestive system, and general hygienic measures will prove sufficient. A general anesthetic should not be given in cases with an incipient or advanced pulmonary tuberculosis. If an operation is absolutely necessary, nitrous oxide is the anesthetic of choice. In cases with "latent" or "apparently arrested" tuberculous lesions, however, it is often advisable to operate on the nose and throat if the patient is subject to frequent coryza or angina attacks. It is evident from the tabulated results that removal of the tonsils is not a satisfactory therapeutic or prophylactic measure in chorea. The ultimate result as to the recurrence of chorea is unfavorable. The authors wish to emphasize that the hyperplasia of the glands at the angle of the jaw, so common in children and young adults, is an evidence of chronic infection of the nose or throat. The most frequent situation of the chronic infection is the tonsils. Occasionally we see a patient with evident chronic tonsillitis without palpably enlarged cervical glands, but this is exceptional. When the glands at the angle of the jaw on one or both sides are palpably enlarged it is advisable to consider a removal of the patient's tonsils, regardless of their size or appearance. In the majority of cases the enlarged glands are apparently due to a chronic pyogenic infection, and will subside after tonsillectomy; in others they are due to tubercle bacilli. In twenty-one of 366 cases the glands, subsequent to the operation, gradually assumed the characteristics of a tuberculous infection. In thirty-six additional cases the glands did not subside, and are treated as incipient tuberculous glands. It is advisable that all cases with enlarged cervical glands be treated along general hygienic lines in addition to the local treatment of the nose and throat. Tonsillectomy alone will not cure a tuberculous cervical adenitis, an arthritis or a glomerular nephritis. It is necessary in these cases to carry out all general measures that will tend to increase the patient's resistance. If the tonsils are the primary focus of infection, however, their removal may materially alter the prognosis by preventing a constant reinfection.

Experimental Studies of Intestinal Flora.—The experiments on puppies by W. R. Sisson (*Amer. Jour. Child. Dis.*, 1917, xiii, 117) were carried out with the purpose of ascertaining the effect of various foods commonly used in infant feeding on the bacterial flora of the intestinal tract. He found that in puppies the types of organisms occurring in the duodenum, ileum, cecum and rectum are in all instances similar. One cannot speak of a characteristic local flora occurring in these regions. Feeding to puppies cow's milk mixtures with high percentage of sucrose or lactose does not cause characteristic changes in the intestinal flora at any level, even when a diarrhea is produced. Starvation of twenty-four hours leads to a relative amicrobism of the small intestine.

Hematology of Infectious Diarrhea.—C. J. Bloom (*Amer. Jour. Dis. Child.*, 1917, xiii, 128) divides the infectious diarrheas into three groups: Group 1, the cases in which the etiologic factor was the *Bacillus dysenteriæ* (number of cases, sixteen); Group 2, the causative factor being the *B. welchii* (*B. aerogenes-capsulatus*) (number of cases, five); and Group 3, the cases with a mixed infection (number of cases, four). He finds a progressive weekly increase in the total leukocyte count and a corresponding fall in temperature. The range of the leukocyte count is least with Flexner bacillus infection and greatest with the mixed infection. Group 1 is characterized by having a normal leukocyte count at the onset, followed within from two to four days by a marked leukopenia, which persists until the convalescent period, unless there are complications. Group 2 is characterized by a rather high leukocyte count throughout the illness. Group 3 shows a marked leukocytosis from the beginning, slightly decreasing toward the middle of the illness, but always showing an increased cell count. If one of the organisms is the typhoid or paratyphoid bacillus, combined with *B. welchii*, then the leukocytosis will be diminished; but, on the other hand, if the *B. welchii* is combined with streptococci, a greater leukocyte count than Group 2 will be noticed. Group 1 shows a high neutrophilic count for the first two weeks, with corresponding low, small mononuclear count. Large monuclears are increased throughout; eosinophils and basophils are rare. There is slight increase in neutrophils and a slight decrease of the small mononuclears for the third and the fourth week. Generally a rise follows a remission of the neutrophils and *vice versa* for the lymphocytes. Myelocytes were present in five cases. Transitional cells were present, particularly when a toxic element was in evidence. In Group 2 there are slight increase of neutrophils and absence of eosinophilia. Group 3 shows a small increase in the neutrophils, and a corresponding decrease in the small mononuclears. The large mononuclears show a greater increase than in the two previous groups.

Immediate Tonsillectomy in Acute Endocarditis.—E. C. Fleischner (*Arch. Pediat.*, 1917, xxxiv, 118) advocates immediate tonsillectomy in cases of acute endocarditis in children in whom there has previously been no cardiac lesion. Granting that acute endocarditis is always a secondary infection and that a very large proportion of these cases have for their etiological agent a primary focus in diseased tonsils he favors removing the primary focus in a child who is suffering from an acute infection, taking the chance that his lowered vitality makes him a poorer subject for surgical treatment, knowing that this added slight risk is more than compensated for by the fact that the patient is so placed in a position where his chances of combating the infection are increased manifold by eradicating the source of his disease.

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ORIGINAL COMMUNICATIONS.

THE DEVELOPMENT OF PRENATAL CARE IN THE BOROUGH OF MANHATTAN, NEW YORK CITY.*

BY

RALPH W. LOBENSTINE, M. D.,
New York City.

In studying the attitude of the community in its relation to the child, we find four more or less well-defined periods or stages.

The first may be called the stage of infanticide as seen for example to-day in numerous communities of China; where chiefly from economic reasons many infants, largely females, are sacrificed each year. We find in such communities a deliberate and intentional destruction of infant life.

The second stage shows marked progress. There is no longer wilful sacrifice, but an enormous loss due to an ignorant and indifferent public and to an unenlightened medical profession.

In the third period we come face to face with community awakening, with the development of a sense of responsibility at the needless waste and a new era brought into existence through intensive child welfare study; improvement in the milk supply and organization. Most of those present to-night are conversant with the splendid work that has already been accomplished in lessening infant mortality and in the reduction of morbidity.

To all these efforts and to the faithful men and women who have accomplished so much, we render due homage.

To-night we meet to discuss infant life from still another angle, *i.e.*, life from its earliest beginning, and in so doing we pass into what may prove to be the greatest period in the history of life, —conservation.

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*Read at a Symposium on Prenatal Care at the Section on Obstetrics and Gynecology of the New York Academy of Medicine, May 22, 1917.

The present is truly a most opportune time to initiate an intensive prenatal campaign. Our aim should be to furnish every mother during pregnancy with intelligent oversight; to keep her from commercial exploitation and to render childbirth reasonably safe, so that not only her own life and health may be spared, but that of the offspring as well. The unceasing and reckless wastage of child life should be stopped.

Aside from the deaths due to injury or accident at birth, the large early infant mortality is substantially dependent upon the same causes that are responsible for the intrauterine death of the fetus. So far, the care of the mother during pregnancy and childbirth has been utterly inadequate and has received relatively scant attention. Some excellent work, it is true, has already been accomplished, but such work has been, of necessity, limited in degree and largely lacking in organization and coöperative effort.

Comparatively few women realize either the need or the value to themselves and their offspring of careful oversight from week to week, and month to month, throughout the period of gestation. This is true not only of the ignorant, but largely so, of the more educated and refined.

Is it not the case, that even in the private practice of the majority of physicians, genuine prenatal care and training are treated in a superficial manner? It is high time that every community should be aroused and that all should realize that the real, logical time to begin guarding infant life, is not after birth, but rather in the earlier periods of development. The mother has too long been neglected. Pregnancy has too long been merely treated as the "natural lot of woman" and its hazards have been either neglected or accepted as inevitable.

We know, however, that pregnancy is accompanied by many complications; that many deaths ensue therefrom and that the closer the supervision, the fewer will be the complications, the fewer the deaths. Prenatal care will not at all times, prevent serious results; it will, however, greatly lessen the chances of their developing; furthermore, it prepares the mother more adequately for labor, lessens subsequent invalidism and has a very marked influence upon the welfare of the infant. Note this, I pray—the finest skill at the time of delivery may not and frequently cannot save the life of the child, or even the life of the mother, when prenatal care has been insufficient or entirely wanting. It is difficult to estimate the number of partial or complete invalids resulting from either poor nursing, inefficient medical attention during pregnancy or meddlesome midwifery during labor.

Comparing the death rate due to childbirth in the United States with foreign countries, it has been shown that out of the sixteen leading countries, the United States stands fourteenth—our death rate in this field being surpassed only by Switzerland and Spain; while Sweden with a total death rate of 6 per 100,000 stands at the top (Fig. 1). Such a record is one that should fill us all, I think, with shame.

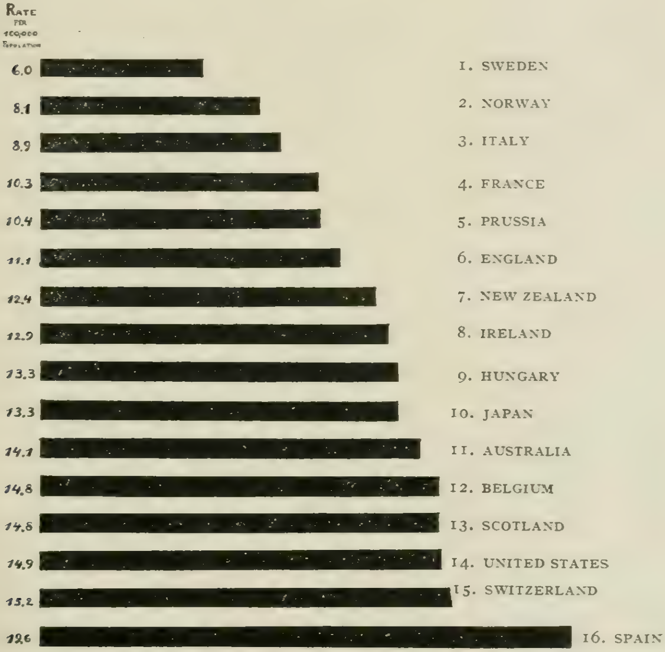

FIG. 1.—Maternal death rates in certain countries from diseases caused by pregnancy and confinement. (From latest reports.)

A further striking illustration or statement of the destruction of life from inadequate prenatal and natal care is furnished us by the Federal Children's Bureau in Washington. "More women between the ages of fifteen and forty-five years of age die in the United States from conditions incident to maternity than from any other cause except tuberculosis; and since 1900 where the death rate from tuberculosis, typhoid fever, diphtheria, croup and from certain other preventable diseases has been greatly reduced, the available figures for the death registration area, show *no* decrease in the proportion of mothers whose lives are yearly sacrificed as a result of ignorance and neglect." (Meigs.)

The effect upon the child of prenatal neglect is startling. The loss of life at all stages up to the end of the first eight weeks is almost unbelievable.

In 1916 in New York City 12,818 infants died under one year of age; of this number 6219 or 48.5 died under two months, largely of prenatal causes, including injuries at birth.* We find equally striking figures in a report from the Woman's Coöperative Guild of London.† In 348 families there were 1396 live children.

There were 83 stillbirths (5.9 per 100 live births).
218 miscarriages (15.6 per 100 live births).

That is, the total of stillbirths and miscarriages was

301 or 21½ per 100 live births.

Of the 1396 live births

122 died during the first year.
26 died during the first week.
12 more before the end of the first month.
23 later from antenatal causes.

Thus 50 per cent. of the deaths during the first year occurred from causes operative before birth.

Much of this loss is directly due to the physcial strain of too frequent childbearing and to the all-too short period of rest after labor. The strain not only affects the mother herself by lowering her vitality, but vitiates to a marked degree the normal development of the offspring. This manifests itself in an increased tendency to abortion, prematurity, immaturity and stillbirth. The question of large families and of pregnancies recurring repeatedly at too close intervals, is perhaps the hardest problem for those in the poorer walks of life. As one poor mother who has suffered and has benefited latterly from advice regarding birth control has put it—"All the beautiful in motherhood is very nice if one has plenty to bring up a family on, but what real mother is going to bring a life into the world to be pushed into the drudgery of the world at the earliest possible moment." ‡

The scope of the work we are discussing is very broad, because, to adequately cope with it we are forced not only to consider the medical aspect thereof, but to study the intricate economic questions of the day—the drudgery and humdrum of early life; ignorance, amazing in its extent; indifference of the more fortunate strata of the social world and medical profession, but slowly awakening to a realization of the opportunities lost and to a responsibility but little appreciated.

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* The stillbirth rate was 4.61 to 4.54.

† "Maternity," London, 1915.

‡ "Maternity". (l.c.)

Having taken this brief survey of a situation far from reassuring, I will ask you to consider with me a few of the practical questions that are now being studied by a "Special Committee on Prenatal Work" in the Borough of Manhattan, with its estimated population of 2,682,977. Impressed with the many difficulties surrounding the parturient, with the needless illness and the unnecessary loss of both maternal and infant life, Commissioner of Health Emerson in the winter of 1915 appointed a small committee consisting of Dr. J. C. Edgar, Dr. Van Ingen and the speaker, to make an analysis of obstetrical conditions in this borough. Mr. J. H. Larsen of the New York Milk Committee has recently joined this group of workers and the New York City Women's Club is planning to lend their aid in district organization.

It is not our purpose to start anew to prove that *great and lasting good can be accomplished by thorough prenatal work.* This has already been admirably shown by numerous organizations, such as the New York Milk Committee, the Department of Child Hygiene under Dr. Josephine Baker, the Association for Improving the Condition of the Poor, by the work under Dr. Emmons in Boston, and others.

What we are desirous of accomplishing is in substance:

1. First the extension of these efforts.
2. The coördination of all the agencies participating in prenatal and child welfare work, and
3. Improvement in "obstetrical attention" at the time of labor.

The general situation seems to us to offer some perplexing problems. In some sections of the Borough there are no obstetrical facilities, in others the institutions are too close together. Some of these are good; some poor. Many agencies are found to be doing some form of prenatal work, but there is no real coördination. The overlapping of hospitals and social efforts is often marked. We, therefore, began to look at the needs of the obstetrical community from the standpoint *not* of an individual clinic nor of a particular society, but from the standpoint of "*communal interest.*" We have endeavored to work and plan throughout under the guidance of the Departments of Health and Public Charities.

The first and natural question to present itself was one of distribution. In other words: we endeavored to show graphically by means of a map, the house location of every labor case cared for by the different hospitals in this borough, during the year 1915. There were 65,215 births on Manhattan Island in 1915.

By reviewing these 65,000 odd birth certificates, the home address of every patient residing in the borough who was confined by either the in-door or out-door service of hospitals, was obtained and recorded on our city map by means of a certain symbol. A separate symbol was used for in-door and out-door services. Each hospital was given a prescribed color, so that we were able readily by means of our map to determine whether or not the individual hospitals doing obstetrical work were following prescribed districts, or were drawing their cases more or less at random, throughout the Borough. Counting only those cases that were handled by hospital services having more than 100 cases in one year, we find that in 1915 approximately 20,000 cases had the advantage of some form of hospital advice, and this number was handled by twenty-one hospitals. Certain of these were found to limit their districts quite closely to their immediate surroundings and to the need of their immediate communities. The majority however, show a more or less total lack of system in their mode of attracting patients.

The territory covered by a number is far too great. For instance; one hospital in the Fifties was found to do a great business in upper Harlem, while Bellevue in East 26th street, probably owing to its midwife training and its ambulance facilities, was called on for help in many instances, well up above East 125th Street. To those of us who have closely studied this map, this utter lack of limited districting and the constant overlapping of the work of one hospital by that of another, appear very impressive.

We feel that this casual method of distributing patients is unsatisfactory both to physician and patient. From the standpoint of prenatal care, it has a serious disadvantage: in that patients will not readily go to a clinic for advice at the necessarily frequent intervals, if the distance is great. The items of carfare and of time lost, are both highly important to the poor parturient. Furthermore, inasmuch as we deem it necessary, so far as is possible, that all cases registered in a given clinic, who do not report at regular intervals, should be visited in their homes, such confused districts and such great distances add materially to the energy and time consumed by the district nurse or social worker.

It would seem advisable that the Borough should be re-districted according to hospital facilities, if widespread and more thorough prenatal supervision are to be obtained.

There has been no standard as to the quality of prenatal work done, or as to the length of time through which this prenatal care is carried out. Several of the hospitals—even otherwise good—are woefully deficient in real prenatal oversight. The largest hospital service in the city finds it utterly impossible to practise adequate supervision of the expectant mother in the home.

The next problem dealt with this re-arrangement of hospital districts. The map here shown (Figs. 2 and 3) represents the Borough as divided into twelve obstetrical zones. These zones have been mapped out so as to include in their boundaries a certain number of so-called health census areas. They represent both in-door and out-door services, and are arranged so as to cause no injury to any individual hospital service, although they will entail a certain amount of re-distribution of patients in each zone. We find by comparing the total number of births in any one zone with the total number of cases handled by the in-door and out-door hospital services of said zone that it is very evident that no hardships will be caused by any proposed change in districting. As a matter of fact, in no district have hospitals cared for more than half of the total number of births contained therein.

The third question before the committee concerns itself with an analysis of all the agencies in each district that are doing prenatal work or that represent potential prenatal stations. In a prenatal survey carried on in 1916 by the New York Milk Committe, an effort was made to visit every organization engaged in any form of child welfare work. There were 127 institutions visited that were doing work of this type. Of this number thirty-five were doing prenatal work. Among the hospitals there were eighteen doing good work in the clinic, but only six that attempted follow-up work in the homes. Counting all these 127 agencies as prenatal potentialities, we are hoping rapidly to win their coöperation and to institute a central bureau in each district, in order that a systematic, intelligent and coördinate plan of prenatal care, adequate provision at childbirth and proper supervision of the infant after birth may be developed. In a measure this is the crux of the whole situation, namely; proper coördination of the work, so that help may be given where needed and overlapping of energy may be eliminated as far as possible.

It is our purpose to develop as many prenatal sub-stations, stations that shall merely examine patients and give advice, as seems feasible.

We should like if possible to have these stations not further apart than from one to one and a half miles, and we hope to have at

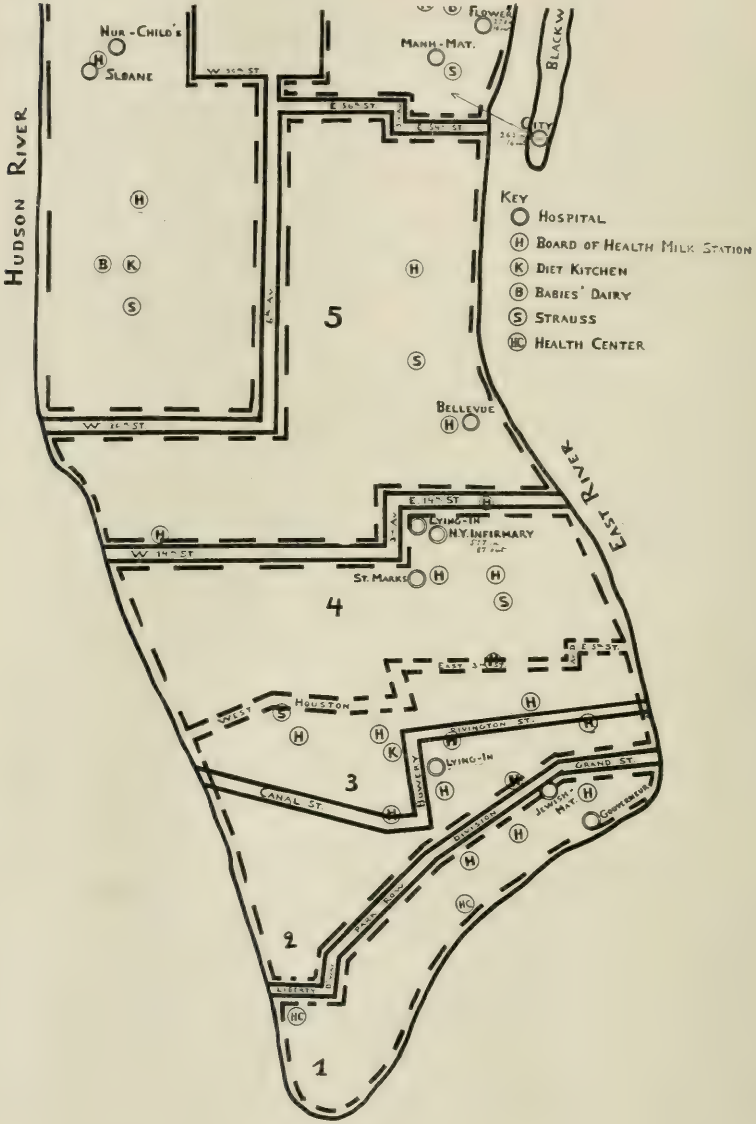

FIG. 2.

each of these agencies a physician in charge, at least twice a week and a nurse on call, daily.

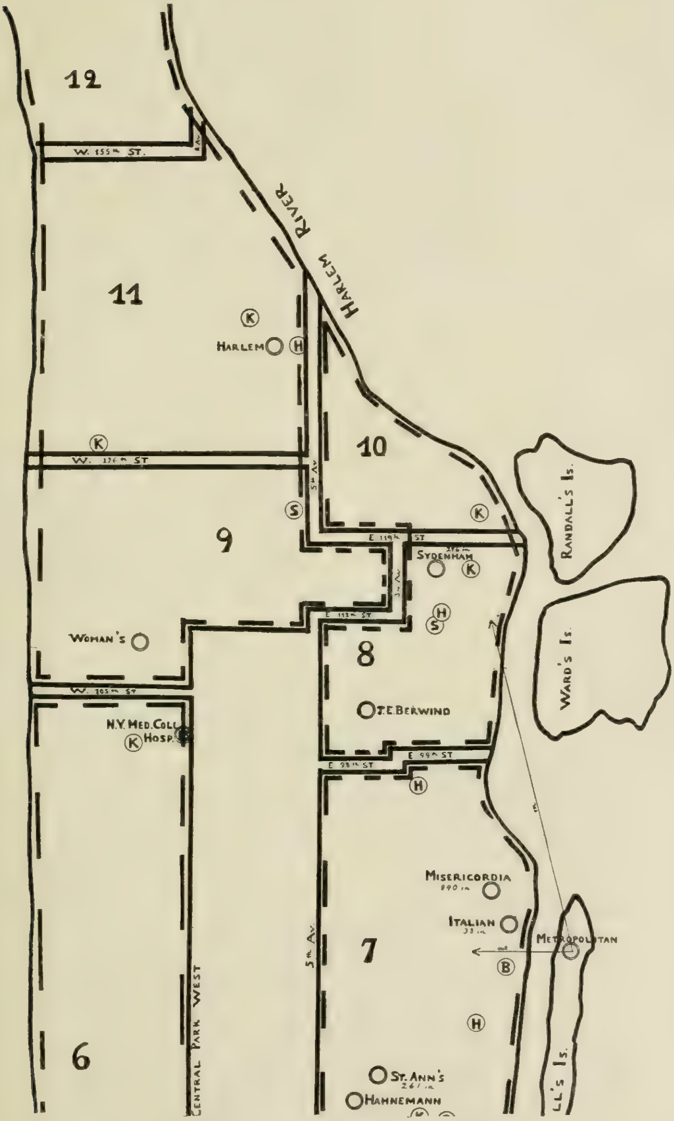

FIG. 3.

FIGS. 2 AND 3.—Outline map of the Borough of Manhattan showing proposed hospital zones for maternity and prenatal service based on U. S. Census districts and N. Y. City Board of Health sanitary areas.

BIRTHS AND INFANT DEATH RATE, BOROUGH OF MANHATTAN, 1915.

Zone	Births	Deaths under one year	Rate per 1000
1	4,399	448	101.9
2	4,661	388	83.3
3	6,896	621	90.1
4	8,798	887	100.5
5	4,851	686	143.4
6	7,597	955	125.7
7	7,458	1324	180.0
8	6,241	649	103.0
9	3,215	274	85.3
10	1,791	196	109.4
11	4,075	382	93.7
12	1,716	110	64.1
	61,598	6920	

HOSPITALS SHOWING IN-AND-OUT SERVICE.

Zone	Hospital	In	Out
1	Jewish Maternity.......	1417	141
	Gouverneur............	285	28
2	Lying-In, Broome St.........		1702
4	Lying-In...............	2522	1701
	New York Infirmary.....	577	87
	St. Mark's.............	149	
5	Bellevue...............	927	657
6	Nursery and Child's.....	428	746
	Sloane.................	1591	
7	Misericordia...........	440	
	Italian................	38	
	Metropolitan (also zone 8)	501	11
	St. Ann's..............	261	
	Hahnemann............	306	
	Flower................	278	16
	Manhattan Maternity...	522	1165
	City..................	263	16
8	J. E. Berwind..........	35	1333
	Sydenham.............	296	
9	Woman's..............	265	
11	Harlem...............	876	83

The burden of the task will fall heavily upon the district nurse and social worker and it is in order to supply the field with a greater number of these, that adequate funds will be needed. We should not

NUMBER OF BIRTHS, NUMBER AND PERCENTAGE OF MATERNITY CASES CARED FOR IN TOTAL IN-AND-OUT HOSPITAL SERVICE, BY ZONES.

Zone	In	Hospital service		Out
	No.	Per cent.	No.	Per cent.
1	285	6	169	4
2	1417	30		
2, 3	....	...	1702	15
3, 4	3188	20		
4	....	...	1788	20
5	927	19	657	13
6	2157	39	751	14
7	1668	22	1208	16
8	977	13		
9, 10	....	...	1333	14
9	265	18		
10	296	16		
11, 12	876	15		
9, 11, 12	....	...	83	1

forget that the hospitals only reach about 30 per cent. of expectant mothers and that the other 70 per cent. are cared for by private physicians and midwives. It is to these we would particularly appeal. This undertaking needs their interest; their suggestions and their coöperation. We have no selfish aims and we aim to arouse no antagonism. With this broad administrative plan developed, we hope that there may result a marked improvement in the welfare of both mother and child, and we expect to be in a position to obtain sufficient data to warrant further study of such questions as the following:

1. A uniform birth certificate throughout the registration area of the United States.

2. An intensive study into the prenatal and natal causes of still-births. This question is a very pressing one and needs to be taken up in a more scientific manner.

3. It is high time for a national agitation for higher obstetrical standards and for the gradual elimination of the midwife although as yet, the latter seems necessary.

4. In a city like New York, there is a pressing need for more free maternity beds, as well as for improved facilities for respectable obstetric patients in moderate circumstances. Of these two needs, the latter is perhaps the more urgent.

These are by no means all the difficulties awaiting solution, but they are among the more important that require investigation before really satisfactory standards can be obtained. Let us trust that when this city has coördinated and systematized the supervision of the needy parturient, other communities may rapidly do likewise, so that the national disgrace now resting upon us, namely, the disgrace of improper and incomplete registration, of low obstetrical standards and of municipal indifference to the grand problem of Motherhood may vanish, and that we may take our stand in this as in other spheres, among the most enlightened countries of the globe.

"The State must realize that if it wants citizens and healthy citizens, it must make it possible for men and women to have families by living a full life themselves and giving a full life to their children. At the present moment this is not possible from top to bottom of the working class, unless the economic position of the working class family be improved."

"What we need here is municipal, not philanthropic action. It is not charity, but the united action of the community that will relieve the widespread social evil."

162 East Seventy-first Street.

Since the reading of this paper, the committee mentioned above, has been dissolved and a new one appointed by the Commissioner of Health. This committee is to be called The Association of Maternity Clinics of the Borough of Manhattan.

MATERNAL MORTALITY FROM CHILDBIRTH IN THE UNITED STATES AND ITS RELATION TO PRENATAL CARE.*

BY
GRACE L. MEIGS, M. D.,
Division of Hygiene, Children's Bureau, U. S. Department of Labor,
Washington, D. C.

Last year an interesting English report came into the Children's Bureau. This was the Report on Maternal Mortality in Connection with Child-bearing(1) by Sir Arthur Newsholme, the Medical Officer of the Local Government Board of England and Wales. The fact that this report, dealing primarily with the welfare of babies and their mothers, was prepared and printed as one of the most important pieces of work of the Medical Officer of this Board during the first year of the war is very significant. It is evidence of the added interest which the war has given to the preservation of the lives of mothers and infants, an interest reflected in reports from many different foreign countries. After reading Dr. Newsholme's report we realized that we had no such collection of material for the United States, and so we undertook, therefore, to make a summary of the information which is available from the official statistics of this country.

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* Read at a Symposium on Prenatal Care at the Section on Obstetrics and Gynecology of the New York Academy of Medicine, May 22, 1917.

The principal questions to which we hoped to derive answers were these: What is the death rate from childbirth (including under this term all the complications of pregnancy and labor) in the United States, and how does it compare with that of important foreign countries; is this death rate falling? Do particular factors: nationality, race, rural or urban conditions affect this death rate?

The difficulties which we met in attempting to answer questions such as these through a study of vital statistics, are well known to you; about one-half of our little report, "Maternal Mortality"(2), is given up to consideration of these difficulties, and of the reservations with which all statements based on the figures must be accepted. I shall not trouble you with these questions now; I think you will agree with our conclusion: That the figures for the number of deaths and the death rates from childbirth and especially from puerperal septicemia are certainly no exaggeration of the truth, but rather give a gross underestimate of actual conditions. I think we all agree, on the other hand, that statements comparing the death rates for different years, and for different countries are open to question, and should be accepted with reserve, as representing the only information now available.

Unfortunately the points about which we should like most to have definite knowledge are those on which the information is least reliable. Whether the death rate from childbirth and especially from puerperal septicemia has fallen in this country since the institution and better development of methods of asepsis, is of vital importance, and necessarily interests all of us. It is equally important for us to know whether conditions in the United States are better or worse than those in certain other civilized countries. In answer to these questions we can only say that the available figures give no evidence of a decrease in the death rate from childbirth in this part of the United States for which we have records during the twenty-three years from 1890 to 1913; or during the thirteen years from 1900 to 1913, periods marked by an enormous decline in the death rates of certain preventable diseases such as typhoid, diphtheria and tuberculosis; and that of the fifteen important foreign countries studied only two have death rates from childbirth higher than the rate of the registration area of the United States, while one country, Sweden, has a death rate less than half that of this area.

To me the most significant fact brought out by the figures is one about the truth of which there can be no question; the fact that childbirth is even now in this country and this age a greater hazard to women of childbearing age than any disease except tuberculosis. The death rate from childbirth as usually given, based on the total population of all ages and both sexes, conceals this important fact; and even yet the death rate reckoned in the latter way is not much less than that of typhoid.

These figures must demonstrate that the whole question of the better protection of women during pregnancy and at confinement is a question of public health protection of the greatest possible importance. It is surely a question which has never received its proper measure of interest from the public or from the medical profession in general. Neither can alone be blamed. Manifestly the figures I have cited cannot fairly be used as an arraignment of the physicians of this country. As Dr. Williams(3) pointed out five years ago, in most medical colleges in this country the teaching of obstetrics is still given far too unimportant a place; graduates from these colleges beginning their practice are often totally unprepared to manage any but absolutely normal cases of confinement, and they are untrained in the practice of asepsis as applied to obstetrics. Probably some improvement has taken place since the time Dr. Williams' paper was written, but undoubtedly much improvement is needed. That many women lose their lives because of the lack of training of physicians is undoubtedly true.

The fundamental reason, however, why women in the United States have as yet failed to receive their just share of benefit from the discoveries of Holmes, Semmelweiss, Pasteur, and Lister, and of great modern obstetricians lies, I believe, much deeper than this question of medical education, important as it is. The subject of childbirth is still shrouded by a mist of prejudice, ignorance and fatalism. Women do not know what sort of protection during pregnancy and at childbirth they need and have a right to demand. Most women do not seek care as a matter of course early in pregnancy; most families think an expenditure of money for this purpose unnecessary. Deaths at childbirth, when they do occur, are looked upon with fatalistic acceptance. Obstetricians will never be paid sums which are an adequate return for skilled care, based on thorough knowledge, until the importance of good obstetrical care is generally realized by the women who bear children. A greater popular appreciation of the importance of good obstetrical care, and of what it includes, will bring with it at once a greater appreciation of the importance of good obstetrics on the part of the medical colleges, and of communities. In a democratic country all work for public health protection must depend on the support given to it by popular interest and understanding. Before a community as a whole will study its death rate from childbirth with as much interest as it observes that from infantile paralysis, or will see that proper prenatal and obstetrical care are within the reach of every mother, most of the women and men in that community must realize a good many facts about the care of childbirth. This, then, like all problems of public health protection is fundamentally one of education.

During the last few years a good deal has been accomplished in teaching women the simple facts about the care which they should have during pregnancy and confinement A beginning has been made in removing the whole subject of childbirth from the realm of the mysterious and unknown into its true place as a subject which women have a right to know all about because it concerns their most important profession. Many well-educated women now know much about this subject, and understand and appreciate the work of their physicians in giving them prenatal care; but this represents only a beginning. It is a question of making this simple knowledge *common* knowledge; of bringing it about that the grandmother or neighbor shall advise the young expectant mother to see a doctor, and to have her urine examined just as automatically as she now advises herb teas of unholy composition.

How this is to be taught seems to me a somewhat peculiar and difficult problem in public health education. Two contrasting facts —that in the vast majority of cases labor is normal, unless complicated by the uncleanliness or interference of an attendant; but that a complicated case of labor is one of the gravest of surgical emergencies—make the whole subject a difficult one for public health education. We teach that prenatal care and skilled obstetrical care are necessary because a certain constant though small number of cases of pregnancy and labor are sure to be complicated. But most people base their opinions on their own experience, not on statistics. A woman, who has known of many uncomplicated deliveries among her friends where no skilled prenatal or obstetrical care has been given and who has never known of a fatal complication, is hard to convince that it is necessary or worth while to allow a physician to take the measurement of her pelvis, or to make a monthly examination of her urine. Still more difficult is it to convince her husband that it is necessary to spend his scarce dollars to have these precautions taken. This difficulty should be realized for it is a real one.

The fundamental problem of providing means for the proper prenatal and obstetrical care of all the mothers of a community is therefore the same everywhere I believe. The demand for better care on the part of those interested—women and their husbands—is essential. Beyond this the question of the methods by which this care can be provided is an extremely complicated one, compared with which the protection of the health of babies is very simple. Every type of community has special problems to solve. Those of a large city are different from those of a rural district; and those of a community in the north from those of a community in the south, east or west.

During the past year the Children's Bureau has been making studies of the kind of prenatal and obstetrical care which women have in different types of communities—in a large city, and in rural districts in various parts of the country. These have been made as a part of studies of infant mortality. According to the plan adopted in all these studies, the first of which was made in Johnstown, Pa., the agents of the Bureau visit the mothers of all the babies whose births have been registered in that community in one calendar year. Though a certain number of mothers cannot be found, often because they have moved away, the study covers in general the whole community, and gives us, as it were, a cross-section of conditions which affected mothers and babies in that place and that year. The questions we have added this year to our investigations cover many points relating to the last and former confinements of the mother. About the last confinement we learn details as far as we can regarding the care, prenatal and obstetrical, which she obtained from physician, hospital, clinic, midwife, or nurse; we learn too what work she did during pregnancy and in the puerperium and what help she had with her usual work at these times; and record all the information she gives as to the complications of pregnancy and confinement, both of the last and of former pregnancies. For a certain number of cases information has been obtained in regard to the cost to the mother of parental and obstetrical care. The nationality, literacy, income and occupation of the mother are learned in addition.

This study has been carried on during the past year in Baltimore, Maryland; when it is completed we shall have this information for about 12,000 women who bore children in that city during the year 1915.

The mass of material obtained should, we believe, when analyzed, give information which may be helpful to other cities. In carrying out the study in Baltimore, we had the advantage of studying a city where a great deal of work had been done by well-known agencies of high standards for the care of women before and at confinement. All of these have taken an interest in our study and helped us; Dr. Williams at Johns Hopkins University has advised us throughout. For a city of the type of Baltimore, the study should give us answers to questions such as these:

1. What proportion of all the women bearing children in a given year have had adequate prenatal care?

2. Do the women having adequate care fall in the group of those having large, medium or small incomes? It is often said that only the very rich and the very poor have proper obstetrical care; the study should give some evidence of the truth or error of this statement. The sort of care women of moderate means obtain is one of the most interesting and important questions; community measures for better obstetrics are incomplete, which leave out of consideration this large and important group.

3. How far do the existing agencies in such a typical city cover the field and provide free prenatal and obstetrical care for those unable to pay for it any but very small sums? This will be another point which the study should bring out.

Few cities, large or small, have yet worked out the problem of how to insure good care for every mother of whatever income group. The working out of such comprehensive programs for a city, where the methods which have proved successful in smaller experiments of prenatal and obstetrical care are applied on a large scale, will surely be among the developments of coming years.

Those of us who live and work in the cities know little about the conditions of rural obstetrics. Letters which have come to the Children's Bureau from women in the rural districts have made us want to know more about the kind of prenatal and obstetrical care women in the country can obtain, and something about the difficulties of giving them adequate care. Ever since the publication of the Bureau's pamphlet on "Prenatal Care" (4) women in the country have written somewhat bitterly to the Bureau, asking how they could put its advice into practice; how a woman could have medical advice during pregnancy when the nearest doctor was across the mountains, or thirty miles away; how the wife of a laborer earning $1.50 a day on a farm could engage a physician for confinement when the charge for a physician's care in this section of the country was $35.00. A few months ago a woman wrote to the Bureau from an isolated ranch in a far western state, sixty-five miles from a doctor and nurse. She was looking forward to her coming confinement with horror and dread, because of the tragedies which had happened on nearby ranches. In her house was a baby of eleven months whom she had adopted; the winter before, she had gone to the mother when the baby was born, riding 7 miles on horseback with the thermometer twenty-two degrees below zero. There was no doctor or nurse. The mother died a few hours after the baby was born, and the woman writing took the baby home. Only a short time before she wrote, the wife of another neighbor had become desperately ill twelve hours after the birth of her baby, when she had been unattended by anyone but the neighbor woman. A doctor was finally brought, but got there only a few hours before the woman died. Such stories of isolation and hardship may seem extreme, and manifestly cannot apply to rural districts in all parts of the country; but they have made us anxious to study at first hand the conditions under which women in the country in different parts of the United States go through pregnancy and childbirth. During the past year we have made studies similar to that described for Baltimore in a number of typical rural districts, one a prosperous wheat-growing region on the prairies in the West; two in a midwestern state, one in the cotton country of the South, and one in the mountains of the South. The reports of these studies are not yet published. As illustrating the very different conditions found in these districts, we have summed up in a little paper on "Rural Obstetrics"(5) a few of the conditions in small sample areas of a few of the districts.

Though the problems of these communities are far removed from those of a city such as this, you may be interested to hear what some of them are. One district studied was a prosperous township in the Middle West where medical service is not inaccessible, for no part of of the township is more than 6 miles from a physician and nearly everyone has a telephone. Almost all the mothers interviewed had medical care at confinement; but adequate prenatal care was uncommon. Only three out of fifty women had had a urinalysis; in only one case had pelvic measurements been made. And yet in a number of these fifty cases pregnancy was not normal. Four of the fifty babies were delivered with forceps. One of these four mothers had a constant hemorrhage following labor and died a day later. No physician was called in consultation. None of the fifty mothers had any trained nursing care before or at confinement. This was a prosperous and progressive community, and may be considered typical of many rural districts in the Middle West. Many of the women had read articles on infant and prenatal care and were anxious to learn more. As yet, much is still unsatisfactory here, for most women have no prenatal care even in complicated cases; none have trained nursing care; and hospital care for complicated cases is unknown. Still the prospects are bright for improvement.

Another district in the same state showed very different conditions. This portion of a township is wild country, parts of which are uninhabited or broken only by isolated clearings; it is 8 to 20 miles from a town and a hospital; it has no railroad, no mail delivery and few telephones. Physicians are rarely called to confinement cases, which are attended usually by farmers' wives who have acquired more or less experience. They may be called neighborhood midwives, though all are unregistered, most are without training, and none make any charge for their services. Their patients give them a present of $2 or $3 for their help. No one could make a living by doing this work exclusively in that region. Without the help given by these women, the mothers would have no assistance at confinement but that given by their families.

A township in a southern state, in the flat cotton country, showed conditions still entirely different. In this township there were several planters with their tenants, the latter working largely on shares, many small farmers, and farm laborers. Many of the colored people in the township lived under conditions of extreme poverty. Of fifty mothers interviewed first, twenty-six were white and twenty-four colored. Only ten white women were attended by physicians at their last confinement, while fifteen white women and all twenty-four colored women were attended by colored midwives. Inaccessibility accounts in part for the failure of most of the women to have medical care. The town whose physicians are most accessible is 4 to 20 miles from different parts of the township. While the main roads are good, parts of the township are almost cut off by the impassable condition of the roads. The nearest physician lives only two miles from a portion of the township, just across a swift river which must be crossed in a bateau. Many of the mothers spoke of the time which it takes to get this physician. At night or after a rain it is almost impossible for him to cross the river.

Inaccessibility is not the only reason why physicians are rarely called to confinement cases. Many of the women, especially among the colored, are quite unable to pay doctor's fees. The colored midwives charge $2 or $3 for care at confinement, and $2 a week for nursing service.

If there were more time I could tell you of conditions just as different found in other rural districts in the South and far West. The three given are enough to show that one cannot generalize very much about conditions of prenatal and obstetrical care in rural districts. One can say, however, that in all rural districts inaccessibility adds its share to every difficulty encountered in the city. It is bound to be more expensive in time and trouble to give proper medical and nursing care, prenatal and obstetrical, in the country than it is in the city. It will always take a greater push of conviction and public opinion to secure it in the country than it does in the city.

Conscious efforts to provide such care for the women of a rural district have not yet been made except to a limited extent in this country. We hope to see the development of such effort during the next few years. This may come about on the basis of the county as a unit. A public-health nursing service, supported by the county, would seem to be the logical first step in providing proper prenatal and obstetrical care. Through such a service instruction in prenatal care could be given; urinalysis could be made and cases with symptoms of complications be found and persuaded to seek medical advice. All mothers could be urged to see a physician at least once as early as possible in pregnancy. Centers at the county seat and elsewhere throughout the county where mothers could obtain advice as to their own care and that of their babies would no doubt follow. A county maternity hospital, even though only a cottage hospital, or beds for maternity cases in a general hospital, would form part of the plan. Provision for skilled attendance for all women, with access to especially skilled assistance for complicated cases would be, of course, all important. How such provision can be worked out in poor and inaccessible districts will be the hardest part of the development of such a county unit. In some regions such units may be worked out with the township as the unit.

My subject was "Maternal Mortality in the United States and Its Relation to Prenatal Care." I have not thought it necessary to prove to you that the high death rate from childbirth in this country is related to the lack of prenatal care such as we find it in a large city and even more in such rural districts as I have described. This relation is manifest. What we are all interested in is to bring about an improvement. The magnitude and complexity of the task is perhaps discouraging. The high death rate of this country from childbirth proves, however, that it is a task which is worth while to undertake.

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PRENATAL CARE—AN OPPORTUNITY FOR THE MEDICAL PROFESSION.*

BY

ARTHUR B. EMMONS, M. D.,

Boston, Mass.

Introduction.—The problem which challenges the doctor who to-day undertakes to practise obstetrics will be briefly sketched. The causes which have been shown to lead up to this situation will be mentioned, and finally a plan to prevent these prenatal causes will be suggested, with examples of results already obtained.

I. The U. S. Life Tables, published in 1916 by the Bureau of the Census, show the following condition in the original registration area for 1910; chart No. 1, *infant mortality by months* of life in U. S., both sexes; in Massachusetts, each sex. Chart No. 2 shows the same and in addition N. Y. state. This chart also shows the Massachusetts stillbirth rate superposed on the mortality of the first month of life, and below on the side, the U. S. *maternal mortality* per 1000 live births, 1910, as given by Meigs(1). Meigs goes on to show by charts (pp. 18–19) that this maternal mortality has since 1900 been steadily rising, so that in 1913, among women of child-bearing age in the U. S., more women (15,376) died from childbirth than from any disease except tuberculosis. New York City alone among the large cities shows a recent decline; the rate for 1905 per 100,000 inhabitants was 20.3; in 1913, 14.1. Boston meanwhile has exactly reversed these figures, the rate for 1905 being 14.1, and for 1913, 20.6.

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It is considered reasonable to attribute the *deaths* in the *first month of life* to causes existing before birth or at the time of birth. Certainly the measures to prevent such deaths should have influence on the health of mother and child far beyond the first month.

We see that the *mortality* of the *first month* comes to *nearly* 40 *per cent.* of the total to which it is reasonable to add the stillbirth rate of about an equal amount, though not included in mortality tables. Reduced *infant vitality* must be included in this picture of waste. This is estimated to be eight times the number of actual deaths. Maternal morbidity will more readily be admitted to be a far larger proportion as compared to maternal mortality.

Such then is the sum of loss occurring during the time when the obstetricians of the country are responsible for their patients. Conservative estimates put the possible reduction under our present knowledge as one-half. My opinion is that a profession united in an effort to meet this problem would prevent much more.

II. Prenatal Causes.—What are they? Up to very recently, the efforts of the medical profession have been directed to meeting the emergencies of pregnancy, *i.e.* eclampsia, placenta previa, etc., and of the complications of labor. Lately the attention of thoughtful obstetricians has turned more and more to preventive measure, such as the *hygiene* of *pregnancy*, including care of the *teeth*, thus reducing toxic poisoning and improving the digestion; *diet*, including the whole field of *metabolism* which is being explored by Slemons, Williams and others. Closely allied to this field are the studies on blood and blood pressure. A fertile field of research lies open in the influence of pregnancy on the *emotions* and their relation to toxic conditions. A suggestive paper has recently appeared by F. B. Sherbon(2). She asks why one woman has a normal physiological childbirth and another the opposite. Is this mysterious maternal competency inherited or physically trained, and how much depends on girlhood?

Turning to the concrete studies of conditions, the most important and instructive in many ways is the Report of the Children's Bureau of Johnstown, Pa. Here the different factors are brought out. Family income below a certain scale immediately raises infant mortality, often more than doubling it. With this goes the employment of the pregnant woman and the poor environment, as well as ignorance of the care of herself and her infant, resulting in prematurity and a weakling. Newsholme of England, in his recent report on child mortality, emphasizes strongly the factor of ability to secure proper assistance when needed. This he feels is as great a factor as maternal ignorance. This proper assistance is the factor which directly concerns us obstetricians, for we may be directly responsible for both the ignorance and the available assistance. To meet this situation we are developing rapidly in this country the local health center, which corresponds closely to the English "maternity center." A recent survey, "How Two Thousand Detroit Mothers were Cared for in Childbirth," has brought out forcibly the inadequate care which the women of little and even those of moderate means receive to-day in the U. S. Many of these were wives of mechanics, working in the auto shops on good pay. 1384 patients had doctors, and less than half of these had a urinary examination made. Prenatal care was conspicuous by its neglect. The care during and after confinement was correspondingly poor. The usual doctor's fee was $20 to $25. Mendenhall(3) calls strikingly to our notice obstetrical neglect. This is a careful study with accurate tables and figures on which to base substantial conclusions and strongly emphasizes the rural handicaps. More than 50 per cent. of the infant mortality occurs in the first month of life. Maternal death rate from maternity is gradually increasing. Puerperal sepsis is increasing. Maternity is a greater danger to women of child-bearing age in Wisconsin than tuberculosis or cancer. Physicians deliver five-sixths of women.

A high percentage of stillbirths goes with a high maternal death rate.

This survey is one of the best gauges of the lack of the effectiveness of the practice of obstetrics to-day. It seems likely from reports received that similar surveys elsewhere would corroborate this evidence with but slight variation throughout the country.

To me, as an obstetrician, such evidence as is here presented has seemed a challenge to my profession.

I have come to New York, to-night, with the feeling that the obstetricians of this great city are so organized that they might undertake to set in motion a movement which would meet this challenge successfully, the organization of a system to make child-bearing reasonably safe. Thus only can we meet our responsibility and command respect as obstetricians.

III. Successful Results.—The successful results of which I wish to speak are experiments in how to give our various communities, city and country, 100 per cent. good obstetric service up to our present knowledge.

Others are to discuss some of the successful work done here in New York City. My part is to describe the Boston conditions and experiments. Before doing this, however, I wish to call attention to the significant work in Philadelphia. They have started in the health centers prenatal care with medical and nursing supervision, along with their general health work. This I believe is sound. In Rochester, N. Y., Dr. Goler is giving prenatal care in school centers. Pittsburg has a model hospital with five local clinics, covering the whole city. The city of Washington has four prenatal conferences.

In Kansas, Dr. DeVilbiss, through the Division of Child Hygiene, is inaugurating many successful innovations throughout the State; thus, as public health officer she is reaching the rural women, by such means as a confidential registry of pregnancies. To each mother instructive letters are sent. Healthy babies are certified, etc.

In Boston intensive prenatal work was first done by Mrs. W. L. Putnam with a single nurse who visited cases registered for delivery at two maternity hospitals. The success of this experiment was so striking that it resulted in the Boston Lying-in Hospital organizing their own clinic and the Instructive District Nursing Association undertaking similar work throughout the city.

The next step was the establishing of special prenatal clinics, one in connection with the Maverick Dispensary, a health center in East Boston, one in connection with the Peter Bent Brigham Hospital, a large general hospital, and a third in connection with the Cambridge Neighborhood House.

The obstetric care is given these patients in their homes by graduate physicians with obstetric training, who work under and are supervised by an obstetrician, and who receive $10 per case.

Organized prenatal and obstetric care is thus given independently of medical students, and is available therefore away from a medical teaching center.

The meager results I have to offer are suggestive rather than conclusive, and but point the way. Davis(4) gives figures and a chart of five wards in Boston. These are based on cases given prenatal care, without baby hygiene care afterward. They are compared graphically on page 10 with the other births in the same wards.

The saving in babies' lives up to the first year of life varied from 25 to 87 per cent. in the different wards.

The method of procedure is simple. The patient comes to the clinic, preferably at the time she suspects pregnancy. She is examined and measured, individual advice given before the nurse who then visits her in the home every ten days, the patient revisiting the clinic at intervals. After delivery she receives postnatal nursing by these same nurses.

The next step has just been started at one clinic, and I think it a vitally important one, that of having a nurse present at the confinement. The Cambridge Visiting Nurse Association has already succeeded in doing this at a cost of $2 per case, with the strict rule that the nurse remains on the case only while the doctor is there.

CONCLUSION.

Surveys and health reports are pointing the finger at child-bearing as the largest factor in waste of life and health, which is left untouched by the recent wave of public health. Child-bearing is, next to tuberculosis, the greatest danger to public health.

The causes are many, both social and medical. One of the most potent, however, is the lack of concentrated and constructive effort by the medical profession. The duty lies with the obstetrician. To the obstetrician is open the opportunity to lead.

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86 Bay State Road.

SOME ECONOMIC HINTS FROM FRANCE.

BY

THEODORE C. MERRILL, M. D.,

Washington, D. C.

The problem of maintaining standards, obtained after a long and difficult struggle, concerning the labor day, labor age and woman's part in industry is being slowly brought before our people. In the nations which have been at war since 1914, it has been more keenly incarnated. Now that our country is committed to the war, the opinion* that "the military and financial policies of the United States should contemplate a long contest of the first magnitude" is too plainly fundamental to require comment; it is among these policies that the maintenance-of-standard question exists as a component.

The employment of women in factories, and especially in munitions factories, has brought into vivid existence, particularly in England and France and, we may believe in Germany, the serious problem of preserving the race at its source. The same problem, though not at present grave in America, is nevertheless of vital interest to the people of the United States. It may be better to consider it now, at some leisure and deliberation, rather than to ignore it until it becomes insistent through necessity.

Asking ourselves how the fighting nations have reacted, in particular, to the infant mortality question, we obtain little information from the Central Powers; a part of the answer is contained in special legislation and organization considerably developed in Great Britain: and certain valuable suggestions may be credited to France, in which the situation is especially acute.

Surely it is well for our people to be aware of recent French efforts to meet the infant mortality problem somewhat more than half way. This effort, represented by measures advocated by competent students and scientists, may well prove in the sequel to be of no small service to America, where the prevention of infant mortality is becoming more and more clearly essential as a factor in the national integrity.

These measures, in the form of resolutions, have been adopted by the French Academy of Medicine after prolonged discussion. They owe their existence to Dr. Adolphe Pinard, of the University of Paris.

Since the outbreak of hostilities, Dr. Pinard has presented to the Academy three papers, all dealing with protection of infant life in France in relation to conditions existing, respectively, after five months, one year and two years of the war. The last paper was read at a session of the Academy held December 19, 1916.

It squarely raised the issue whether the employment, in munitions factories, of women during pregnancy and nursing should be prohibited altogether, or whether it should be permitted under certain restrictions. Pinard believes that it should be prohibited absolutely.

Dr. Paul Strauss, President of the Central Office of Maternal and Infantile Assistance, discussed Pinard's paper at length. Differing from Pinard, he expressed an opinion based on careful reports made by competent advisory physicians. His conclusions were in favor of employment, so regulated as to provide physical and financial protection for women workers during pregnancy and lactation, as well as for their infants and children.

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* Bullock, Charles J., "Financing the War," *Quarterly Journal of Economics*, May, 1917.

The sharp divergence of view resulted in the appointment of a special committee to examine the subject and render a report. The committee consisted of Pinard, acting as chairman, his opponent Strauss and eight other men eminent in their fields of obstetrics and pediatrics.

Their report, made to the Academy on January 30, 1917, was in the form of six resolutions. During sessions continued to March 6, the report was discussed in detail, in connection with a minority report offered by Dr. Charles Richet, certain amendments being suggested. The labors of the Academy and its committee were finally crystallized on March 13 into the following resolutions:

I. Pregnant women and nursing mothers, employed in factories and especially munitions factories, should be subjected to tasks whose nature and duration require only moderate effort.

Every occupation likely to produce gradual or sudden injury, or to exact undue fatigue or insufficient sleep, should be forbidden; the half-day system, with a maximum of six hours' labor, is preferable.

Pregnant women and nursing mothers should be entirely relieved from night work. They should be excluded from every task which, on account of its harmful, toxic or unhygienic character might prejudice their health, and thereby harmfully affect pregnancy or lactation.

II. Rest, according to individual need, for the approximate period of four weeks preceding confinement, as provided by the law of June 17, 1913, should be made compulsory for women workers in munitions factories.

III. Consultations on maternal and infant hygiene, under the direction of a physician, should be available for women workers, in order to provide information and advice.

It should be the duty of the physician in charge to prescribe, as advisable, change of occupation or more moderate labor for the pregnant woman, and to suspend her from labor when, in his judgment, her continuance at work would endanger her health or menace the life of her infant.

In order to secure to women working in factories, and especially in munitions factories, the benefits of the special hygiene applicable to women, a female supervisor, intermediate between the male superintendent and the employee, is absolutely necessary. There should be in France, as in England, a factory directress or woman supervisor.

IV. In order to encourage maternal nursing, measures should be instituted in factories, and especially in munitions factories, to enable mothers to nurse their infants, under strict conditions of hygiene, during the period of their employment. To the same end, premiums should be awarded to mothers who nurse their infants while continuing at work.

V. Pregnant or nursing women, obliged by their condition to change the character of their work, to reduce the amount of their labor or to quit work, should receive an indemnity compensating for the reduction or suspension of their pay. Funds to meet the expense resulting from this regulation should be provided and administered by a government bureau or office.

VI. Retiring rooms, in which mothers may nurse their infants during the hours of labor, and also children's playrooms, should be provided by the government whenever necessary.

Such is the plan recommended in France as a substitute for Pinard's ideal, which is for the present abandoned as impracticable. The situation is admirably expressed by Doléris, secretary of the Academy's committee: "This is a question of France's life or death. On the one hand, the committee has not wished to incur reproach, nor to assume the responsibility for introducing confusion into the work of saving the nation; on the other, it has had to arrive at a practical solution. It must first secure the national life."

Just before the close of the Academy's session on March 13, attention was called to the broad question of national depopulation. At the following session (March 20), a committee was appointed to examine the subject. This committee consists of nine members, including Pinard and Strauss, together with three new members and four of the men who served on the previous committee. It is now at work and should bring in a report no less useful and important than the opinion and provisions contained in the resolutions referred to here.

BUREAU OF CHEMISTRY, WASHINGTON, D. C.

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OBSTRUCTIVE JAUNDICE.*

BY

CHAS. GORDON HEYD, B. A., M. D.,

Associate Professor of Surgery, New York Post-Graduate
School and Hospital,
New York.

(With five illustrations.)

The gall-bladder, liver, duodenum, pancreas and stomach are embryologically, anatomically, physiologically and pathologically closely related and should be considered as one functional system(1).

An orderly and rational presentation of the conditions in which jaundice is a symptom necessarily implies an anatomical exposition.

Jaundice is a symptom only and is due to the deposition of bilirubin and biliverdin in the tissues. It is recognized clinically by the coloration of the skin and visible mucous membranes and by the presence of bile derivatives in the urine. In brief, the clinical phenomena associated with jaundice are due to the presence of bile pigments in the circulating blood and tissues and to the absence of biliary constituents from the intestine.

Jaundice is such a protean and variable symptom and is associated with so many conditions that individually it offers little in the way of diagnostic value, but when associated with the clinical history, physical examination, the chemical examination of urine, stool and blood and with variations in the functions of the organs of the right upper quadrant it is a material aid in diagnosis.

In its ultimate analysis jaundice is an interference with the delivery of bile from the liver to the intestinal tract, and is due to the passage of bile pigments into the circulation by means of the hepatic capillaries and, to a less extent, by the lymphatics.

Increasing experimentation and research proves that probably with the rarest exception jaundice is essentially an obstructive phenomenon. The obstruction affects either the large extrahepatic bile vessels or the smaller intrahepatic bile vessels and therefore all jaundice is hepatogenous in that its site of production resides in the liver.

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* From the Surgical Department of New York Post-Graduate Hospital, Dr. John F. Erdmann, Director. The material and cases upon which this paper is based is from the collective surgical service of the department. I am particularly indebted for the privilege of utilizing the personal material of Dr. Erdmann.

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The formation of bilirubin and biliverdin from hemoglobin is limited to the cells of the liver and nowhere can the elaboration of bile pigments be carried out except in the liver and in no place can this function be vicariously assumed(2). It is true, however, that in the neighborhood of large collections of blood there is a breaking down of hemoglobin with the formation of hematoidin which is chemically identical with bilirubin, while the presence of free hemoglobin in the bloodstream leads to an increase in the elaboration of bile pigments (or polychromia—pleichromia) but does not, *per se*, give rise to jaundice. Furthermore, jaundice is seen where marked hemolysis has occurred. This phenomenon is regarded as the conjoint result of two processes—the hemolysis destroying the red blood corpuscles on the one hand and at the same time a cholangitis of the intrahepatic ducts(3).

Exceptions to the general statement that all jaundice is obstructive are extremely rare but experiments have proved that bile pigments may be formed after an Eck fistula or after the removal of the liver, spleen and abdomen from the circulation and it seems probable that it is possible for the endothelial cells of the serous cavities to convert blood pigments into its biliary derivatives(4).

In chronic splenomegalic hemolytic jaundice there is no pathological evidence that the jaundice is in any way associated with obstruction. In this condition the jaundice is essentially a dissociated jaundice(5) as is indicated by the presence of bile pigments in the blood without bile salts. This predicates an independent extrahepatic origin for the bile pigments, for in pure obstructive jaundice they are never found in the circulation without the presence of bile salts. Clinical proof is given to this differentiation by the known fragility of the erythrocytes in this condition.

When bile is completely excluded from the intestinal tract no urobilin appears in the urine as it is the end product of bacterial activity upon stercobilin in the stool. In incomplete obstruction, which allows some bile to enter the duodenum, urobilinuria may appear. For a long time it was supposed that "urobilin" or acholuric jaundice was due to the deposition of urobilin in the tissues. This contention is not substantiated, however, as the jaundice is essentially due to the deposition of bile pigments and not urobilin in the tissues.

In the consideration of extrahepatic obstructive jaundice we are concerned with the character and type of obstruction and with its anatomical location. Obstructive jaundice may occur anatomically by obstruction at the portal fissure, the hepatic ducts, the cystic duct, the common duct, ampulla of Vater, pancreas and biliary papilla and, to a less extent, the duodenum and pylorus.

In regard to the mechanism of its production we speak of (1) intrinsic, internal or luminal occlusion, which, except for the rarity of parasites and hydatid cysts, means calculous disease of the common duct, (2) mural occlusion, either inflammation of the duct wall or stricture or neoplasms, and (3) extrinsic or external occlusion, either by invasion or compression from lesions of tissues adjacent to the extrahepatic biliary apparatus.

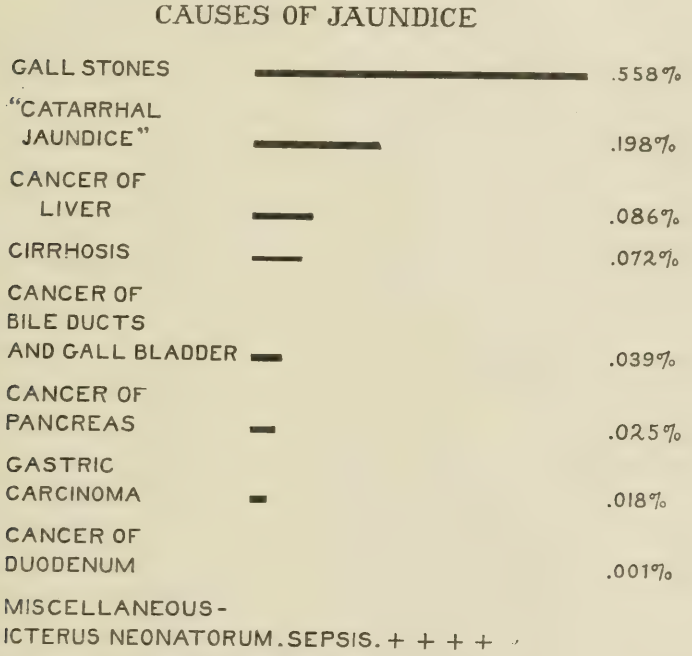

FIG. 1.—Statistical tabulation showing the causative factor in the production of jaundice. (*Modified from Cabot.*)

Statistical inquiry and analysis of a large series of cases exhibiting jaundice(6) demonstrates that according to its frequency jaundice may be classified in the following order: (1) gall-stones, (2) catarrhal jaundice, (3) cancer of the liver, (4) cirrhosis, (5) cancer of the bile ducts and gall-bladder, (6) cancer of the pancreas, and (7) gastric and duodenal carcinoma (Fig. 1). It will readily be seen that by eliminating catarrhal jaundice and cirrhosis of the liver the diagnosis becomes one of differentiating between the jaundice due to gall-stone disease and that from malignancy of the bile ducts.

Catarrhal jaundice is an example of a disease named after its most prominent symptom. Its designation is without any adequate or stable pathological basis. The idea of a gastroduodenitis is probably incorrect, for neither the clinical course nor the necropsy findings support the contention of a papillary or common duct catarrh. The lower end of the common duct and duodenum is relatively free from infectious agents. The diagnosis of catarrhal jaundice is one of the most insecurely founded of all diagnoses at the present time(6).

Jaundice that comes on with or without gastrointestinal disturbances, that has a duration of four to six weeks and then spontaneously clears up, must however with our present knowledge be designated catarrhal jaundice. The outstanding clinical feature is the slight systemic changes in the presence of jaundice. Herein it differs from all other types of jaundice where the systemic changes are marked. Emaciation during an attack of jaundice has little clinical value as emaciation occurs equally with gall-stones, catarrhal jaundice or malignancy. Undoubtedly many cases of temporary derangement of the liver or slight cases of acute degeneration of the hepatic cells are indistinguishable from catarrhal jaundice, Weil's disease or the prodromata of acute yellow atrophy of the liver. Finally, only a "cure" within six to seven weeks can be considered as establishing the diagnosis of catarrhal jaundice.

A case of jaundice that does not clear up within six weeks is either a complication of another condition or the diagnosis is wrong. The deep green or black color of pure obstructive jaundice is never seen in catarrhal jaundice, although the effects of long-continued icterus may be evident. Stupor never occurs in the mild types of jaundice and is absent in gall-stones and even in malignant disease except at the terminal stages. Only in two forms of liver disease is stupor a factor in the presence of jaundice, namely, cirrhosis and acute yellow atrophy.

Sondern(7) draws attention to the fact that the blood picture in cases of simple or catarrhal jaundice is characterized by a depressed leukocyte count and a relative lymphocytosis, while in malignant conditions the leukocytes have a tendency to rise to 8000 to 10,000 with polynuclear percentages of 68 to 75 per cent. In the latter condition there is a more marked cellulicidal effect with a greater degree of anemia.

Mayo Robson(8) believes that most cases of so-called catarrhal jaundice are mild cases of catarrhal pancreatitis and distinguishes two forms: inflammation of the common duct—cholangitic jaundice and swelling of the head of the pancreas—pancreatic jaundice.

Cirrhosis of the liver should rarely offer any diagnostic difficulty.

The diagnostic value of jaundice in connection with diseases of the gall-bladder and biliary ducts is dependent to a great extent upon the antecedent history and whether the jaundice is associated with colic.

Gall-stones rarely exist without producing quite characteristic symptoms and these symptoms can be interpreted into pathological entities with considerable accuracy.

Jaundice due to gall-bladder disease rarely develops after the first attack and still more rarely does it appear suddenly and without colic. It is a symptom of the complications of gall-bladder disease and postulates a diagnosis of disease of the biliary apparatus upon the deferred or incidental occurrence of jaundice.

Ninety-nine per cent. of gall-stones are formed in the gall-bladder(9) and to reach the more ample common duct must migrate through the cystic duct. In the course of this migration colic is developed and only when the calculus reaches the distal portion of the cystic duct may jaundice arise either from compression or coincidental inflammation. Jaundice then is the result of the impinging of a calculus or the tumefaction of inflammation.

If one were to take the life history of a large number of cases of disease of the biliary apparatus he would find that they presented a composite picture in which four well-defined stages of pathology were evidenced: (1) when the disease was confined to the gall-bladder; (2) when there are attacks of biliary colic; (3) when jaundice occurs from common duct obstruction, and (4) when infection or calculi produced coincident disease of the pancreas (Fig. 2).

The early symptoms of gall-stones are not colic and are not jaundice, but are the vague, atypical symptoms of a qualitative dyspepsia, characterized by variations in the degree of gas, eructations; of a sense of fulness, weight or oppression; with a slight tenderness beneath the right costal arch; with a chilly or goose-skin sensation after dinner; with a slight catch in the breath, particularly on the right side suggesting a pleurisy or stitch in the side. This gastric irritability is made worse by certain articles of food, such as fried foods, apples, cheese, nuts, etc., rather than by the quantity of the meal. Into this picture of "gall-bladder dyspepsia" there is suddenly introduced an acute attack of pain, colicky in type, with a marked predilection for nocturnal occurrence, so severe as to require hypodermics of morphine. This colic comes on without premonition or warning,* "out of a clear sky," like lightning, with marked intensity and in four to eight hours disappears spontaneously, leaving a residual soreness along the right costal margin(10).

In neither of these two types has jaundice been a symptom although in the latter phase of biliary colic there may be transient attacks of jaundice. After a variable period the third phase of biliary disease may be introduced by an attack of pain similar to the one outlined, to be followed in four to six hours with jaundice which reaches a maximum intensity within twenty-four to forty-eight hours and associated with this will be the evidence of a well defined sepsis—chill, fever, and sweat, suggesting in its onset and periodicity a malarial paroxysm. Years ago this was known as intermittent hepatic fever (Charcot) and variously ascribed to malaria. The febrile reaction is marked, 104°–105°, with rapid intermission or remission of temperature variously called the "steeple chart" temperature(11), "the angle of cholangic infection"(12).

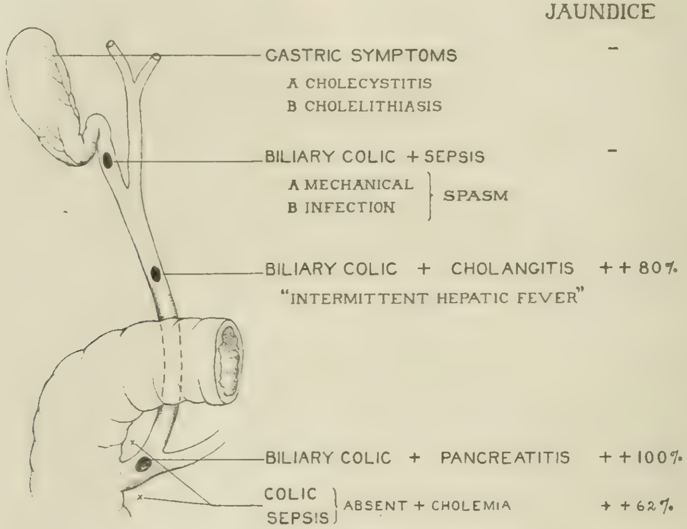

FIG. 2.—Summary of symptomatology in the "four phases" of disease of the biliary apparatus, with differentiation of pancreatic neoplasms.

The diagnosis of calculous disease of the common duct rests upon colic, icterus and sepsis and the symptoms occur in that order. In cystic duct obstruction there is colic and fever and the symptoms occur in that order but there is no jaundice. In calculous disease of the common duct one is impressed by the fact that at the time the patient presents himself jaundice is absent in about 25 per cent. of cases. Inquiry, however, will reveal that in the larger proportion of cases (85 to 90 per cent.) there is a history of a colicky jaundice.

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* Dr. Erdmann writes, "I have found many patients have an aura preceding the attack." (Personal communication.)

The first mechanical factor in calculous obstruction of the common duct is the production of acute biliary obstruction with acholic stools. After a variable period of cholangitis, distention of the duct behind the obstructive calculus occurs, the duct dilates, and the stone floats up into the more ample and dilated common duct, and biliary delivery into the duodenum is resumed(13, 14).

The diagnostic factors in this particular type of jaundice are (1) its onset with colic; (2) its association with sepsis; (3) its intermittency, "it ebbs and flows" with the degree of obstruction; (4) its chronicity.

It must not be forgotten, however, that it is quite possible for a calculus to pass through the common duct and be extruded into the duodenum with no further trouble, because stones which can pass the cystic duct can easily pass through the common duct.(15) If a stone in the common duct is sufficiently large to grossly occlude the common duct jaundice does not become intermittent but takes on a remittent type. Cases of remittent jaundice of twelve to fifteen years duration are recorded in the surgical literature. The greatest tendency is for a stone to become lodged at the ampulla of Vater and by accretions of pigment to increase quite rapidly in size.

Between attacks of calculous obstruction of the common duct the patient may be apparently well but is practically never free from a subicteroidal tint or slight jaundice. The patient is designated as sallow when she is really suffering from a continuous and persistent low grade jaundice or a jaundice of remittent intensity. Many of these patients who are persistently sallow notice that the jaundice varies during the day, becoming deeper toward evening. With each attack of pain and jaundice there is a fever of a characteristic "steeple chart" type, while early in calculous obstruction the liver is enlarged and generally the spleen.

The resultant pathological condition is a dilated and infected common duct with a calculus floating up and down—the ball-valve stone of Osler and Finger—and the mechanical factor is chronic intermittent intrinsic occlusion of the common duct. The pathological conditions are at the same time paralleled clinically by: (*a*) ague-like paroxysms, chills, fever and sweating; the hepatic intermittent fever of Charcot; (*b*) jaundice of varying intensity which persists for months or even years and deepens after each paroxysm; (*c*) during the paroxysms pains in the region of the liver, with gastric disturbances(16).

Stone in the common duct is preponderantly the result of a previous infection of the gall-bladder(17) and predicates a chronic cholecystitis with cicatrization and contracture. In 187 cases of obstruction of the common duct reported by Courvoisier (from the literature) in 100 obstruction was due to causes other than stone and in 87 the obstruction was due to calculous impaction. Of the 100 cases in which obstruction was due to causes other than stone, in 92 there was a dilatation or distention of the gall-bladder and in 8 cases there was a normal gall-bladder or an atrophy of the gall-bladder. Of the 87 cases in which obstruction was due to stone, in 70 cases the gall-bladder was atrophied and in 17 cases the gall-bladder was dilated. Courvoisier then enunciated his law: "In cases of chronic jaundice due to blocking of the common duct, a contraction of the gall-bladder signifies that the obstruction is due to stone; a dilatation of the gall-bladder that the obstruction is due to causes other than stone"(18).

In reporting the cases of the Massachusetts General Hospital Cabot found 86 cases of obstruction of the common duct; 57 were due to calculous obstruction; in 47 the gall-bladder was atrophied; in 8 it was normal; in 2 enlarged; 29 cases of obstruction were due to causes other than stone; in 27 the gall-bladder was distended and in 1 the gall-bladder was empty and 1 contracted around calculi. Four cases only of this series were exceptions to Courvoisier's law. With the exception of these four cases which constituted only 5 per cent. of the total number examined every record of the Massachusetts General Hospital series in which definite statements are to be found concerning the points at issue goes to confirm Courvoisier's law(19).

In 84 per cent. of cases with stone in the common duct we find a contracted gall-bladder. Therefore a case of obstructive jaundice with (1) history of colic; (2) distinct variations in the intensity of the jaundice (remittent or intermittent)—"ebbs and flows"; (3) absence of distention of the gall-bladder; (4) presence of septic reaction—chill, fever, sweat, leukocytosis; (5) continuous or occasional presence of bile in the feces; (6) chronicity, then the diagnosis is almost positively calculous cholangitis(20).

Obstructive jaundice may be due to mural and extrinsic obstruction either by compression or invasion of the common duct. Seriatim the conditions are: inflammation of the head of the pancreas, neoplasm of bile ducts, pancreas, pylorus, stomach, etc.; Plastic peritonitis; lymphatic enlargements—tuberculosis, syphilis, lymphedema, carcinoma; stone in terminal portion of the cystic duct; miscellaneous tumors—kidney, adrenals, etc. Neoplasms of the terminal ducts are symptomatically similar although they may arise from the common bile duct, ampulla of Vater, duct of Wirsung, papilla of Vater, duodenal mucosa and directly from the pancreas (Fig. 3). Carcinoma of the liver or intrahepatic tumors produce jaundice in about 50 per cent. of cases and when primary the jaundice is due to direct pressure on the intrahepatic ducts. In such cases, however, bile passes from the other lobe of the liver into the duodenum, so that the feces retain their normal color and pancreatic digestion is normal. By extension of the growth to the central fissure or if the tumor is secondary by compression along the course of the common duct or at the portal fissure, compression of the portal vein may be induced with ascites. An enlarged liver with persistent jaundice and normal stools with both biliary and pancreatic secretions normal and with the secondary development of ascites and not infrequently (15 per cent.) a Bloomer's shelf(21) should make the diagnosis of cancer of the liver certain.

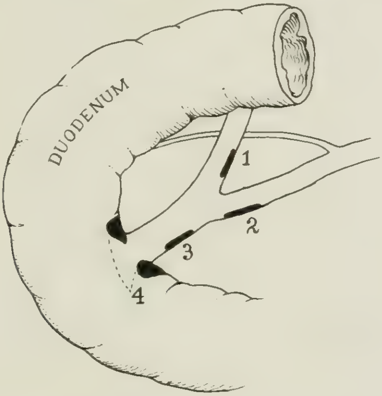

FIG. 3.—Diagram showing the anatomical point of origin of various neoplasms usually ascribed to the pancreas. (*Modified from Rolleston.*)

In neoplasms of the extrahepatic biliary sytem below the cystic duct there is a typical type of jaundice. Since the genesis of tumors requires time, the history of the onset of jaundice is distinct and characteristic. By slow growth a neoplasm produces minimal changes. There is insidious invasion or compression of the biliary passage; jaundice develops imperceptibly so that from day to day it hardly seems to advance in intensity, but without pause or hesitation, without intermitting or remitting, it progressively and continuously deepens in intensity from mild to severe, from lemon color to black, until it becomes a typical icterus melas. In its evolution it is not associated with colic and in its earlier stages it is usually devoid of pain. It is not associated with chills, fever or sweat nor leukocytosis. This jaundice is the result of extrinsic compression or invasion and as there was no preexisting cholecystitis we have approximately in 90 per cent. of the cases a dilated gall-bladder(22). In addition the Courvoisier gall-bladder is usually palpable, increases in size from day to day and enlarges downward toward the middle line about the umbilicus unlike the acutely distended gall-bladder which enlarges upward and inward(23).

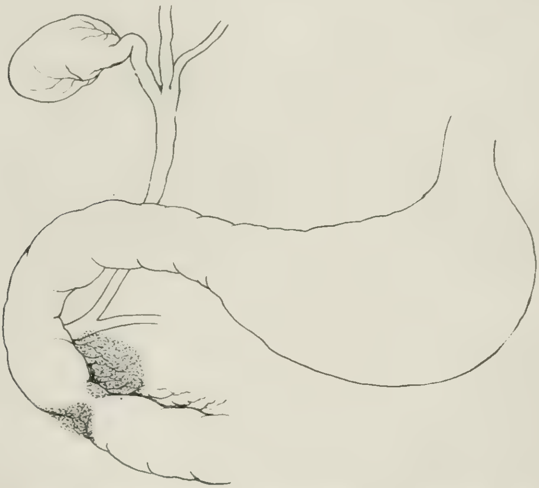

FIG. 4.—(J. S.) "Courvoisier's Gall-bladder." Diagram indicating the location of adenocarcinoma of the second portion of the duodenum with jaundice. Operation: Cholecystostomy and posterior gastroenterostomy. Three months later cholecystojejunostomy. Death one year later.

In carcinoma, variations in the intensity of the jaundice may occur but the fluctuations are less distinct than in calculous disease. In primary carcinoma of the ampulla of Vater or of the duodenal surface of the biliary papilla the jaundice may intermit which it never does in malignant disease of the pancreas and it may also have fever from ascending infective cholangitis from the duodenum but this is infrequent. Fifty per cent. of duodenal carcinomas are situated in the second part and ulcer or carcinoma of the second portion of the duodenum in or about the ampulla of Vater readily invades the termination of the common duct and pancreas (Figs. 4 and 5). Diagnostically it is usually impossible to distinguish carcinoma of the head of the pancreas from primary carcinoma of the common duct and for practical purposes it makes little difference. The recent addition of the duodenal pump for diagnostic purposes promises some aid in differentiation by determination of variations in pancreatic secretion(24).

By reason of the peculiar anatomical topography of the pancreas and the fact that the common duct and duct of Wirsung have a common point of termination the possibility of injuries to the pancreas with cholelithiasis was observed early in biliary surgery. In 38 per cent. of cases the common duct passes behind the pancreas while in the remaining 62 per cent. it traverses the substance of the head of the pancreas(25). A small stone lodged in the ampulla of Vater is capable in 32 per cent. of cases of causing a retrojection of bile into the pancreas, as demonstrated by Opie(26). This, however, must be an extremely rare occurrence as not more than twelve to fourteen cases have been described since 1902.

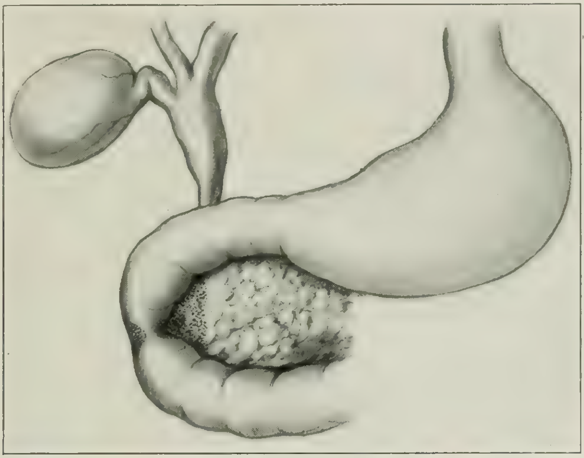

Fig. 5.—(S. A.) "Courvoisier's Gall-bladder." Annular adenocarcinoma second and third portion of the duodenum with extension into the pancreas. Operation: Cholecystogastrostomy and posterior gastroenterostomy. Death eighteen months later.

Chronic pancreatitis possesses a fairly well-defined symptomatology but unfortunately it is so linked up with the preceding or antecedent biliary infection that the diagnosis of pancreatitis almost presupposes the diagnosis of biliary trouble. In 2611 operations on the gall-bladder at the Mayo Clinic the pancreas was involved in 7.6 per cent. In 325 operations on the common duct the pancreas was involved in 22 per cent. and in 168 cases of operation for disease of the pancreas 81 per cent. were accompanied by or due to gall-stones(26). Chronic pancreatitis, however, either acute or chronic does not completely occlude either the biliary or pancreatic ducts(24), and anatomically can only produce jaundice in 62 per cent. of cases by reason of the anatomy of the ducts, but can so closely simulate both calculous cholangitis and malignant disease of the head of the pancreas as to be incapable of clinical differentiation at operation, for a hard pancreas is not necessarily a functionally diseased pancreas and it is a matter of common knowledge among pathologists that a normal pancreas may have a consistency of almost stony hardness and yet have normal physiological function(28).

In carcinoma of the common duct the growth usually allows some bile to enter the intestine so that there is a constant reaction for stercobilin in the stool. The absence of stercobilin in the feces is a valuable sign in that it signifies complete obstruction to the flow of bile and indicates that the common duct is completely or absolutely occluded.

The exceptions to Courvoisier's law are few and far between. Seriatim they are as follows: stone in the cystic duct with hydrops or empyema with stone in the common duct; (2) acute cholecystitis with obstruction of the cystic duct and a stone in the common duct; (3) chronic pancreatitis with stone in the common duct; (4) a stone in the cystic duct with compression of the common hepatic duct; (5) malignant disease along the course of the common duct with an old chronic fibroid cholecystitis(29).

Diagnostic data derived from chemical examination of the stool will depend upon whether there is (1) absence of bile; (2) absence of pancreatic secretion; (3) absence of both biliary and pancreatic secretion.

In obstructive conditions above the duodenum pancreatic secretion is intact and in 32 per cent. of pancreatic malignancy there is no interference with biliary delivery on account of the anatomy of the terminal bile duct.

A neoplasm at the ampulla of Vater either by its presence, by kinking of the duct, or associated edema of the mucous membrane of the duodenum or common duct will bring about not only biliary obstruction but a variable degree of pancreatic obstruction. The degree of obstruction to pancreatic secretion will depend upon the individual anatomical topography of the ducts of the pancreas. In about 83 per cent. of cases the duct of Wirsung carries the entire pancreatic secretion. In about 12 per cent., however, the duct of Santorini is the main duct, while in 54 per cent. the duct of Santorini may act as a substitute for the duct of Wirsung(30). In certain cases the duct of Santorini might remain uninvolved for a considerable period of time, and, moreover, the duct of Santorini is not infrequently connected with the duct of Wirsung, and by reversal of current(31) it is possible for drainage of the pancreatic secretion to take place into the duodenum even with almost complete biliary stasis; in fact, there may be complete biliary stasis with little or no pancreatic retention. Certainly, this must be an extremely rare condition, and, aside from its theoretical interest, does not possess any particular importance.

Any chronic obstructive condition of the duodenum below or at the ampulla of Vater will introduce in addition to the signs of biliary stasis those of pyloric stenosis (Fig. 4).

In gall-stones, pancreatitis, carcinoma of the liver, simple cholangitis, carcinoma of the bile ducts stercobilin is never constantly absent from the feces thus indicating that the obstruction is incomplete. The deviation of the color of the stools is not dependent upon the bile *per se*, but upon the state of fat digestion and absorption. In pancreatic achylia there may be asbestos-colored stool with normal amounts of bile in the stool. The chemical examination of the stools concerns itself therefore with ascertaining the degree of hypochylia of the pancreatic digestion.

Macroscopically, the stools show (1) bulkiness (either fresh or dried pancreatic stool is two or three times heavier than normal); (2) macroscopic fat occurring (*a*) as bulky pieces of fat, (*b*) crumb-like pieces of fat, (*c*) oil drops(32). Microscopically, the presence of undigested meat fibers and a preponderant amount of neutral fat.

In health under normal conditions 5 to 10 per cent. of the nitrogen ingested appears in the stool. When the biliary outlet is occluded the nitrogen content rises to 15 per cent. while in pancreatic occlusion the nitrogen content appears at 50 to 70 per cent.(27).

In health the amount of neutral fat in the stool—fecal fat—represents 15 to 20 per cent. of the fat ingested. In the absence of biliary secretion the fat content rises to 40 per cent.; if there is biliary and pancreatic occlusion the fecal fat rises 50 to 70 per cent., while if there is suppression of both pancreatic and biliary secretion the fecal fat rises from 70 to 90 per cent.(33).

Chemical examination of the urine in regard to the Cammidge test, the presence of lipase and diastase have not proved of much value to us at the Post-Graduate Hospital and we have discontinued doing them. Of late, the researches in blood chemistry(34) have pointed the way to some definite information. Depending upon the degree of pancreatic involvement there is occasionally an associated degeneration of the islands of Langerhans with diabetes or glycosuria. In certain types of cases and also on account of a previous nephritis, glycosuria is not shown when a well-developed hyperglycemia is present, the excess of dextrose being held in the circulation by reason of a high renal index of sugar retention.

The diagnostic value of obstructive jaundice depends upon its association with one or the other of two main symptom groups: a jaundice with colic, with chills, fever and sweat, with leucocytosis, with intermittency, with a previous history of right upper quadrant inflammation, with nonpalpable gall-bladder, with stercobilin and intermittent acholic stools, represents luminal obstructive jaundice and barring the rare accidents of worms, parasites and hydatid cysts, is a calculous disease of the common bile duct: a jaundice without colic, without chills, fever and sweat, without leucocytosis, which never intermits or remits, which is persistent and continuous, increasing and deepening in severity, with a palpable gall-bladder, without stercobilin in the feces and with chronic acholic stools represents an extrinsic obstructive jaundice and is a neoplastic condition outside of the common duct.

8 WEST FIFTY-FIRST STREET.

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RUPTURE OF THE UTERUS.*

BY

WILLIAM A. SCOTT, B. A., M. B.,

Assistant Demonstrator in Obstetrics and Gynecology, Demonstrator in Anatomy,
University of Toronto. Junior Assistant in Obstetrics and Gynecology,
Toronto General Hospital.

(With six illustrations.)

WITHIN the space of two and a half months four cases of rupture of the uterus at term were treated in the Department of Obstetrics and Gynecology at the Toronto General Hospital. These four cases with two previous ones are the only ones that have occurred since

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1906, which is the earliest date that histories are available, and they form the basis of this paper.

During the years 1906–1916, 3973 patients were delivered in our obstetrical wards, exclusive of patients in the private patient building. During that time we have had three ruptures of the uterus and have treated three other cases that were sent in after rupture. Of those arising in the hospital, the first occurred in 1913 and was the only one in 1974 deliveries of which we have the histories. Since that date there have been about 2500 subsequent deliveries with two ruptures. Only one spontaneous rupture has occurred in the 3973 deliveries. These figures are somewhat lower than most of the published statistics. The Berlin "Frauenklinik" had a frequency of rupture of one case in 462 deliveries in a series of 3700 labors. Ivanoff found the percentage to be 1 to 961 in 118,000 labors. Lobenstine studied 37 cases occurring in about 41,800 labors at or near term, which is a proportion of about 1 to 1100. The proportion in home cases has been estimated at about 1 in 1500. Complete rupture occurs about four times as frequently as the incomplete variety.

Of the six cases herein reported, two followed versions in our own wards. One followed manual dilatation, attempts at forceps and then at version outside the hospital. Another followed a long labor and an attempt at high forceps outside. Two were spontaneous ruptures occurring early in labor, one in the hospital and one outside.

Rupture of the uterus may occur during pregnancy or during labor. There is no case of rupture during pregnancy in the histories of the Toronto General Hospital. DeLee says it is one of the rarest accidents of pregnancy, if one excludes perforation of the uterus by criminal abortionists. Baisch, however, in 1903 collects seventy-eight cases. One must, of course, exclude cases of interstitial pregnancies and pregnancies in the rudimentary horn of the uterus. These cases usually rupture in the early months but occasionally go to term when the accident may occur with the first pain. True rupture of the uterus during pregnancy is most frequently due either to previous injury of the uterine wall from infection or scar formation, or to external traumatism. This previous injury may have been due to Cesarean section in a former pregnancy, and Munro Kerr cites examples of such rupture by himself, Eckstein, Mayer, Targett, Galabin, Guillaume, Woyer, Roblanck, Everke and Couvelaire. The case of the last-mentioned author was complicated by hydramnios, and rupture took place spontaneously in the hospital from over-distention. Microscopical examination failed to reveal any evidence of decidual tissue in the scar or of any inflammatory reaction at the site of operation. Rupture from an injury due to infection of the uterus is illustrated by the case of Beyer which occurred at the fourth month of pregnancy in a patient who had had a pyemia after her first labor, and by the case of Armytage which occurred at term. Munro Kerr states that Oswald has collected thirty-eight such cases. Previous rupture where the uterus has not been removed may result in a tear at a subsequent pregnancy. Pelham, cited by Munro Kerr, instances several such cases.

External traumatism has resulted in several cases of rupture during pregnancy. J. Phillips reports a patient who fell 12 or 14 ft. alighting on her buttocks, the rupture being caused by contrecoup and not recognized for ten days. Ehrendorfer saw a similar case occurring after a fall when a patient was seven and one-half months pregnant. In three weeks she had recovered sufficiently to resume her daily occupation but felt no fetal movements. She went two months past her expected date and then entered hospital where laparotomy disclosed a mummified fetus free in the peritoneal cavity. Other cases due to external traumatism are reported by Schroeder, Plenis, and Slavjansky.

Placenta previa may be a determining factor as illustrated by the case of Dr. Arnold Lea. The patient, seven and one-half months pregnant, was suffering from placenta previa and there was presumptive evidence of syphilis. A de Ribes bag was inserted but in five hours the patient's pulse was so high that bipolar version was done. The hand, however, was not inserted into the uterus. The patient died and autopsy revealed a complete tear through the placental site. Microscopically no abnormality could be found in the uterine wall.

Occasionally incarceration of a retroverted uterus leads to rupture during pregnancy. Such a case is reported by John Campbell. The accident took place at six months, although the first symptoms —retention of urine—dated back to four and one-half months. The rupture was discovered sixteen hours after the beginning of labor pains and had taken place between the posterior lip of the cervix and the bladder. The fetus was free in the peritoneal cavity but was delivered from below and the opening packed, the patient recovering.

When we come to consider rupture during labor we find it is either traumatic or spontaneous. The predisposing causes that have been mentioned in the literature are legion but are mostly theoretical. Much is made of degenerative changes in the uterine wall, but of those cases in which the uterus has been examined microscopically in very few instances has any evidence of such change been found. In all of our cases the uterus was sectioned and studied but no degenerative lesion of the musculature could be demonstrated. This degeneration, when present, has been suggested as due to pressure—necrosis of a prolonged previous labor, to puerperal sepsis, especially if curetted, to removal of adherent placenta, to fibroids, and to rupture through the scars of operation or of previous rupture.

In regard to this last factor Becker reports a case of repeated spontaneous rupture and collected twenty-seven similar ones from the literature. The scar of Cesarean section undoubtedly is the cause of some ruptures during labor, although this danger by many authors is held to be small. Munro Kerr had a case arising in a patient thirty weeks pregnant, on whom he had previously done a section. The patient entered the hospital for observation and following an enema complained of epigastric pain but went to sleep. By morning the pain was generalized all over the abdomen but the pulse was normal and there was no vomiting. Signs of shock and some vaginal bleeding occurred later in the day and laparotomy revealed dark blood and the fetus in its unruptured sac free in the abdomen. Last year J. N. Bell collected seventy-eight cases from the literature and added one of his own. Of these twenty-six occurred since 1900. A. J. Rongy has recently stated that in Cesareanised women who subsequently go through labor about 3 per cent. have a ruptured scar and of these over 50 per cent. die. He reports two cases, a spontaneous rupture of the uterine scar during pregnancy, and one a threatened rupture during labor.

Of the traumatic ruptures occurring in labor, there is little to be said, except that the occurrence of spontaneous rupture points to the possibility that some of the traumatic ones may have been the result of very little injury to a uterus just on the point of rupturing. The commonest type of traumatic rupture is that following a version usually performed some time after the rupture of the membranes. It also occurs in attempts at delivery by forceps with the child's head above the pelvic brim, the injury being due either to actual perforation of the uterine wall with the forceps, or to a rupture of the thinned out lower uterine segment. An inexcusable type is the one where forceps are put on the child's head over a thinned out lower segment under the mistaken idea that the cervix is fully dilated. Occasionally one sees cases of the perforation of the uterus following unskilful attempts at embryotomy.

The question of spontaneous rupture on the other hand usually brings to mind the idea of a protracted labor allowed to go an unnecessarily long time and having well-marked premonitory symptoms before rupture. As we shall see, however, this is not always the case, though it is true that pelvic abnormality accounts for a large percentage of all cases of spontaneous rupture, Munro Kerr finding it in 40 per cent. of fourteen cases, Merz in 30 per cent. and Ivanhoff in 40 per cent. of their collected cases

In spontaneous rupture occurring after protracted labor, one gets the type of tear described by Bandl affecting the lower uterine segment and occurring before the presenting part has passed the brim. Bandl says that rupture will occur when the presenting part meets abnormal resistance either by reason of its own size, contraction of the pelvis, obstruction by tumors, or by malpresentation. To this one might add the factor of a pendulous abdomen. Ivanoff inclines to the opinion that these tears are produced by injury of the soft parts between the head and the pelvic wall. All of these cases give premonitory signs and the careful obstetrician will act before the catastrophe occurs. Overdistention of the uterus, the rising of the obliquely directed contraction ring toward the umbilicus, and the tension of the round ligaments, even between pains, are the signs of impending trouble. In addition there is usually a rise of the patient's pulse rate, possibly a slight rise of temperature, and she is suffering from the incessant pain of an ineffectual tonic uterine contraction. Once the rupture occurs the picture quickly changes. The pains usually cease, the patient goes into a condition of collapse with a rapid, low tension pulse, subnormal temperature, drawn white face, and distention of the abdomen usually occurs quickly.

Unfortunately all spontaneous ruptures are not of this character, and if the obstetrician is looking for rupture only in cases of prolonged, difficult labors the more insidious type of rupture may be overlooked. In many of these patients rupture develops without any premonitory signs and may occur under apparently normal conditions. Microscopically, we may find evidence of muscular degeneration, but the contrary is more frequently true, though such authors as Munro Kerr and Schmauch lay great emphasis on previous injuries to the uterine wall either mechanical or septic. In our two cases of early spontaneous rupture, there was no microscopical evidence of muscle degeneration, although both cases showed a well marked infiltration, deep in the muscular wall, of red blood cells. In the light of the findings of J. Whitridge Williams in cases of accidental hemorrhage where there was a diffuse hemorrhagic infiltration separating the uterine muscle fibers, it is possible that a common underlying cause may account for both early spontaneous rupture and premature separation of the normally situated placenta. These ruptures are the most difficult from the standpoint of treatment, for there is usually great injury to the surrounding structures, especially the bladder. Grimsdale, indeed, has reported a case of injury to the bladder during the first stage of labor in an apparently normal woman and without complete rupture of the uterus. The frequency of this type of rupture is illustrated by our two cases in a series of six ruptures. E. H. Tweedy has noted the insidious onset in the occurrence of several cases of uterine rupture in Dublin, and he is of the opinion they are usually associated with vaginal tears and occur during the first stage of labor. He believes that the moving upward and backward of the os might well be regarded as a premonitory sign. Munro Kerr, Olshausen, Hubingi, Small, Frühinsholz and Gross, and Milne Murray, all report similar types of cases. In the case of the last author the left uterine artery was torn but the patient recovered after panhysterectomy though she developed an extraperitoneal abscess during the process. A case of Laforcade illustrates the suddenness of this type of rupture.

His patient, aged forty-two, para-v, with a history of previous long labors but normal deliveries, at the end of twenty-four hours' easy labor, experienced a tearing sensation followed by a stabbing pain and cessation of contractions. His report on the histological examination of the uterus was "interstitial myositis." A peculiar case is reported by Elliott, who on being called to a patient several hours in labor, found the head at the vulva and no contractions. On delivering with forceps he discovered rigor mortis of the dead fetus to which he ascribed the rupture. A case not occurring early in labor but showing neither internal hemorrhage or shock was reported by T. E. Neill. Rupture was due to a retroperitoneal pelvic tumor. Though the great majority of these spontaneous ruptures are complete, Vernon had a case following a manual dilatation and podalic version performed for a hemorrhage and rapid pulse. There were two incomplete tears on the anterior surface of the uterus involving all its coats except the mucosa. The author cites the case as one of spontaneous rupture during normal labor, but in view of Williams' recent article referred to above, there is a great possibility of the tears being due to slight trauma in the uterus showing the muscular infiltration with blood that Williams describes.

From the above references, and from our own series, it is quite evident that this sudden spontaneous rupture early in labor without any warning symptoms, is more common than the prevalent idea credits. The opinions regarding the proper treatment of the condition are diverse. This was even truer in the past than it is to-day. Formerly there were as many advocates of expectant form of treatment, such as packing the tear with gauze, use of the abdominal binder, and the administration of ergot, as there were in favor of operation. To-day, however, the consensus of opinion is that operation should always be resorted to in every case of spontaneous rupture, and in most cases of the traumatic variety. The operative procedure varies with the case. If there is any suspicion of the uterus being infected, total hysterectomy with drainage above and below is indicated. Where there is little likelihood of sepsis but considerable damage to the surrounding tissue, and especially if there be large subperitoneal collections of blood, a subtotal hysterectomy with drainage of the hematoma from below is usually the easiest and safest procedure. A few cases of clean cut tears, especially on the posterior surface of the uterus, are suitable for catgut suturing, but in such cases the danger of a rupture during a subsequent pregnancy should not be forgotten.

Ivanoff is strongly in favor of the operative rather than expectant treatment. Of 124 cases studied by him and all treated with gauze packing and a binder, the mortality was 81.75 per cent. He emphasizes the danger of clots beneath the peritoneum becoming infected. G. Blacker from a study of eight cases of rupture, and his collected statistics, comes to the conclusion that the best results are given by operation. Petren studied 754 previously published cases with recovery of 32 per cent., but of these only 28 per cent. of those treated conservatively recovered, while the operative recoveries were 47 per cent. He says that the statistics of complete rupture are decidedly in favor of laparotomy and as a rule the uterus should be removed. Munro Kerr favors panhysterectomy and plugging of the pelvis with gauze brought out through the vagina, in every case of complete rupture. Schuette between 1903 and 1908 had to treat nineteen cases of rupture, five of which were hopelessly infected and one was an old case. Of the remaining thirteen, eleven were complete ruptures and serious cases. He had only one death in these thirteen cases and he attaches great importance to the treatment of the retroperitoneal hematoma which should be drained from below. Lobenstine reports a total mortality of 73 per cent. of the cases. In twenty-three cases, however, treated by hysterectomy, the mortality was 60 per cent., whereas of fourteen treated by packing, 92 per cent. died. C. H. Davis in the clinic of Dr. Webster of Chicago, says that they are of opinion that operation should always be the form of treatment. DeLee in hospital cases attempts to save the child and then operates for all ruptures. In cases at home he believes in delivering, packing, and then transferring the patient to the hospital. Eden reports three cases treated by abdominal hysterectomy with one death due to recurrent hemorrhage. He says the shock obscures the symptoms of intraabdominal hemorrhage if such exists, and thinks that every case should be operated. Potocki goes so far as to urge Cesarean section in all cases in which rupture appears imminent. On the other hand, A. Lionel Smith had nine deaths in ten cases of rupture, and he favors nonoperative treatment because he thinks the patients are unable to stand an operation.

Our treatment is illustrated by the histories of the following cases, which I desire to report.

Case I.—Mrs. T., History No. 2991, aged thirty-seven, para-xi. This woman who had a fat pendulous abdomen, was a waiting patient in the hospital for nearly six weeks. During that time abdominal palpation gave little information regarding size or position of the child. The presenting part could not be reached from below. According to her menstrual history, she should have been confined on Nov. 26, 1913, and she apparently went four weeks past term. In view of a history of previous easy confinements it was not thought necessary to induce labor. The membranes broke about noon on December 25th, but she did not inform the nurse or house surgeon of the fact. Her pains began at 3.00 A. M. the following morning and were not severe. At 12 noon she was seen by the Chief of Service who found the os not quite half dilated, presenting part still high, and the pains regular but not unusually strong. At 7.30 P. M. the os was nearly dilated and the head not engaged, but at this time the house surgeon made out the position to be R.O.P. It was thought advisable to correct the position and deliver. The house surgeon, under the direction of one of the staff, rotated the occiput to the front and applied forceps but could not deliver. On investigation a firm contracton ring was found to be obstructing delivery. The child at this time was alive; the manipulation that had been carried out was against the performance of a section and accordingly version was decided upon. It was performed with a considerable amount of difficulty and a stillborn child delivered. On attempting to remove the placenta, a large complete rupture of the posterior wall of the uterus was discovered, with intestines in the uterine cavity. There was very little bleeding. The placenta was removed, intestines replaced, and the uterus packed, contracting firmly upon the gauze. Preparations were made for immediate operation, but the patient was obviously dying of shock and succumbed in an hour from the time of rupture. At autopsy the uterus was found firmly contracted, no intestine in the opening, and a very small amount of blood in the peritoneal cavity. Microscopical examination showed an apparently normal uterine wall.

CASE II.—Mrs. C., History No. 22589, para-i, April 6, 1914. This patient had been in labor forty-eight hours, after which a manual dilatation and an attempt at forceps was made by her outside physician. He failed to deliver and brought her to the hospital, where another attempt at forceps was made and failed. On attempting version, a rupture was discovered on the right side of the uterus. A Cesarean section, followed by total hysterectomy and drainage above and below, was done by Dr. Watson. Rupture was between the layers of the broad ligament on the right side. The patient recovered and microscopical examination of uterine wall revealed no sign of degenerative change.

CASE III.—Mrs. N., History No. 30897, aged thirty-seven, para-vi. First pregnancy sixteen years ago. Instrumental deliveries in three cases but none very difficult. No abortions. Last menstruation September 26, 1915. On April 24, 1916, the patient went into labor outside the hospital at 8.00 A. M. She was seen by her outside physician at noon. The cervix was then dilated to admit one finger, her pains were not strong and were occurring every ten minutes. She was seen again at 8.30 P. M. at which time the cervix was three fingers dilated and slight pains were recurring every ten minutes. She was given morphine gr. 1/4 per hypo and slept till 6.00 A. M. the following morning, awakening with sharp pain and some vaginal bleeding. Her physician saw her at 9.00 A. M. and advised her to go to hospital but she refused, and on returning at 11.30 A. M. he found the abdomen distended, rigid, and tender, and the patient with a rapid pulse, temperature of 99.8 and some vomiting. She arrived in the hospital at

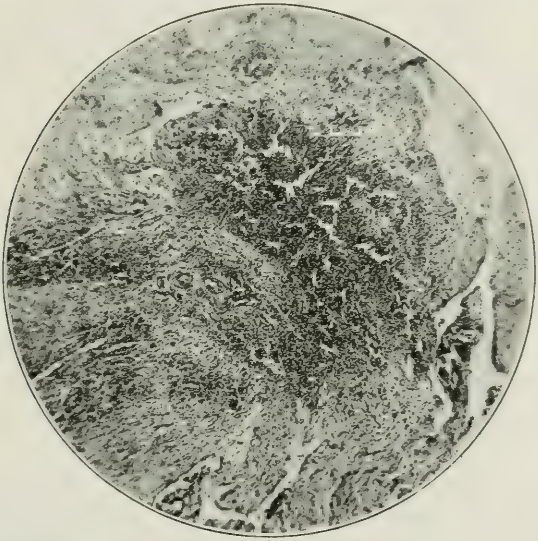

FIG. 1.—Low power from Case No. 3 showing hemorrhage deep in the muscular wall of the uterus on the side of the rupture.

3.00 P. M. and when I saw here an hour later there were no labor pains, the abdomen was distended, rigid and tender; there was no dullness in the flanks; the cervix was nearly dilated and a ragged tear could be felt in the left side of the uterus. The head was presenting above the brim and could be reached with difficulty. Her temperature was 100.6. She was given an anesthetic, when examination revealed the child lying in L.O.A. position, no obstruction to labor, and a rupture in the left side of the uterus. She was delivered easily by version. The placenta was found high up in the peritoneal cavity on the left side. Laparotomy was done at once and a complete tear of the uterus was found extending from the external os to near the fundus on the left side. It ran through the broad ligament, and the left infundibulopelvic ligament was torn across with free bleeding from the ovarian artery which had retracted beneath the peritoneum. The peritoneum was stripped off the left side of the pelvis, exposing the ureter for 2 inches. There was much blood in the abdomen, partly clotted and partly fluid. Complete hysterectomy was done and the cellular tissue was drained with packing through the vagina. The peritoneal cavity was drained with rubber tubing from above. Following operation there was free drainage both above and below but the patient did not do well, and on May 18, streptococcus viridens was found in the blood. She died on June 1. Autopsy revealed a pelvic peritonitis, a retroperitoneal abscess on the left side, ulcers of the ileum where it had become attached to the anterior abdominal wall, and thrombosis of the left iliac and femoral veins.

CASE IV.—Mrs. F., History No. 4895, aged twenty-two, para-ii, May 6, 1916. The patient did not speak English and a full history could not be obtained. Prolonged attempts at delivery had been made outside the hospital. When admitted she was having strong labor pains, her clothes were saturated with blood, her face was dusky, her lips were pale and she had a weak pulse of 130. The head was at the brim and fluid was felt in front of the uterus. On passing a catheter this fluid was found not to be in the bladder. The fetal heart was faintly heard in the left lower quadrant. The perineum was lacerated to the rectum. The scalp of the child was nearly at the vulva and a large hematoma was felt between the scalp and the child's skull. The cord was twice about the baby's neck and a large laceration was discovered in the left side of the uterus. Immediate laparotomy was done, many clots and much free blood being found in the abdomen. The child was removed by Cesarean section but the heart only beat for a few moments. The rupture extended from the vault of the vagina up the left side of the uterus for about 3 inches and then through the posterior layer of the broad ligament, the latter being filled with blood clot. Complete hysterectomy was performed and the abdomen drained by tubing from above and gauze from below. The patient died from sepsis three days later.

CASE V.—Mrs. J., History No. 32389, aged thirty-four, para-viii. This patient had been in hospital waiting confinement for several weeks. Her previous labors had been prolonged in all cases except the last, which had been short although the pains were extremely severe.

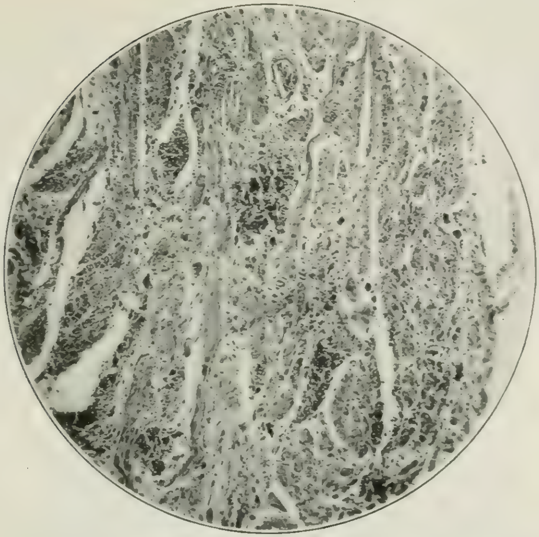

FIG. 2.—Low power from Case No. 5 showing areas of blood infiltration at a considerable depth from the actual rupture. There is no degeneration of the muscle fibers.

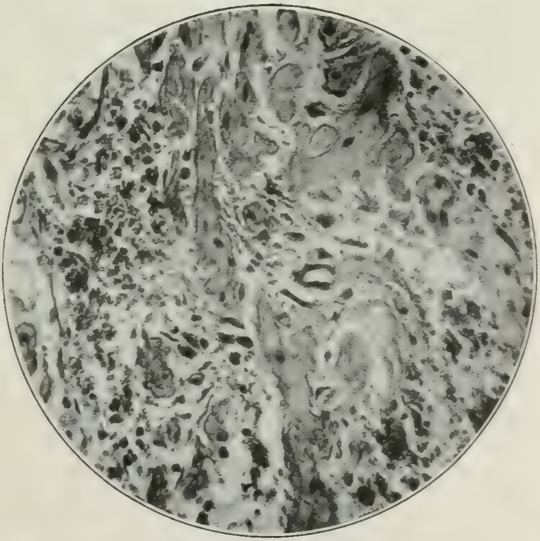

FIG. 3.—High power: Case No. 5. Wide separation of normal muscle bundles by extravasation of red blood cells. Note the normal staining of the muscle fibers.

She had had normal deliveries except the first which was instrumental. On May 30, the patient had some vaginal bleeding of which she told no one at the time. During the afternoon of May 31 she had some irregular pains and abdominal examination showed the head floating above the brim. Pains became regular at 10.00 P. M. and an hour later there was a slight amount of bleeding. At 1.00 A. M. her pains were fairly strong and the cervix was found to be two fingers dilated with the head still above brim. At 2.30 A. M. the membranes ruptured and at this time the patient was having pains every 3 minutes of about ordinary severity. At 5.00 A. M. they gradually died away and evidence of shock appeared. At no time had the contractions been abnormally strong. At 8.00 A. M. there was tenderness over the lower abdomen and on the right side just above Poupart's ligament an indefinite tender swelling could be made out. Her face and lips were pale and the rest of the body was slightly cyanosed. The pulse was weak and rapid, patient felt nauseated and on two occasions vomited. She was stimulated with strychnine and interstitial saline, her color and pulse improving slightly. Laparotomy was performed at 11.00 A. M. On opening the abdomen I found the right broad ligament enormously distended with blood clot. There was free blood in the peritoneal cavity, and a large hematoma between bladder and uterus. The rupture had taken place in the right side of the uterus between the layers of the broad ligament, and the latter had apparently ruptured from pressure. A dead child was removed by Cesarean section and the clot cleared out, after which supravaginal hysterectomy was performed. The cellular tissue was drained

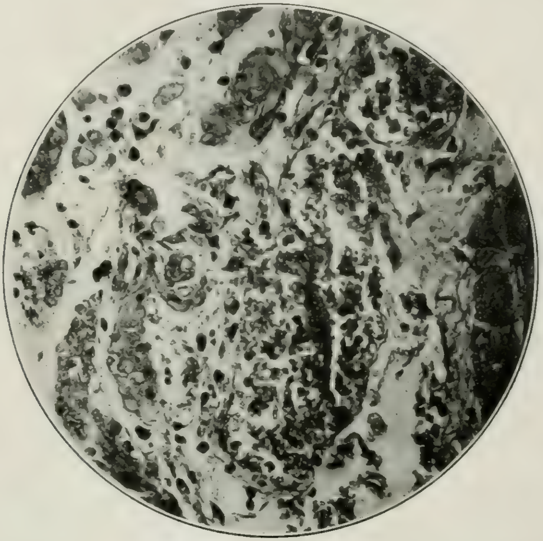

FIG. 4.—High power: Case No. 5. Area showing rupture of wall of small vessel. No apparent degenerative change.

through the stump of the cervix, the peritoneum closed over this drain, and a tube put down into the pouch of Douglas. The following day there was marked distension and some vomiting which were relieved by gastric lavage and an enema. For two weeks her temperature fluctuated between 99 and 101. During this time she was catheterized but upon the seventeenth day urine commenced flowing per vaginam and the catheter obtained only pus. The temperature then remained normal until the thirty-third day when it began to rise and soon reached 103 where it remained for five days. A swelling appeared in the abdominal scar, and on opening it a large amount of pus escaped. The temperature at once dropped and remained normal.

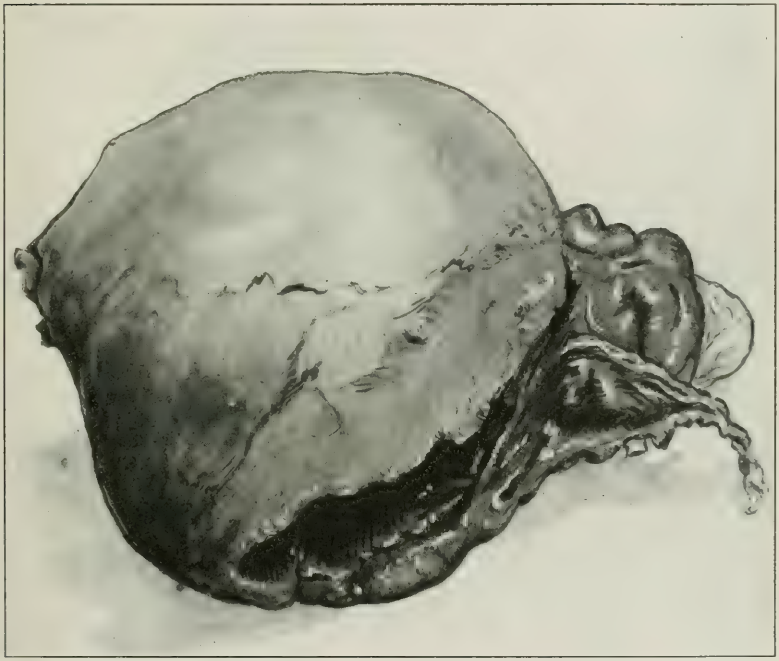

FIG. 5.—Uterus from Case III.

Urine eventually escaped through this abdominal opening but by leaving a catheter in the bladder and irrigating daily the opening closed. She left the hospital on April 18 still having slight leakage per vaginam. This patient returned to my Out-patient Clinic a few days ago and is to come into hospital to have an attempt made at repairing the fistula.

CASE VI.—Mrs. C., History No. 5010, aged twenty-two, para-iii, June 15, 1916. Patient entered the hospital at 5.00 A. M., having moderate and regular labor pains, labor having begun the evening before. The membranes were ruptured but there was a considerable amount of liquor amnii in the uterus. The cervix was fully dilated, the cord prolapsed but pulsating, the head not fixed, and there was a marked projection of the promontory of the sacrum, the true conjugate being estimated at 9 cm. At 7.00 A. M. version was performed by Dr. Kinnear, who experienced considerable difficulty on account of the prominent sacrum. A hook was used for the extraction of shoulders. The child was born in a condition of pallid asphyxia, but recovered under artificial respiration. After waiting thirty minutes, an attempt was made to express the placenta but failed. A hand was then introduced and the placenta found in the peritoneal cavity. It was removed and the tear packed. There were no signs of shock, and at 11.00 A.M. laparotomy was performed by Dr. McIlwraith, who found a complete rupture in the left side of the uterus but confined to its lower segment. There was little hemorrhage into the peritoneal cavity. A subtotal hysterectomy with drainage above and below was performed and the patient made a good recovery.

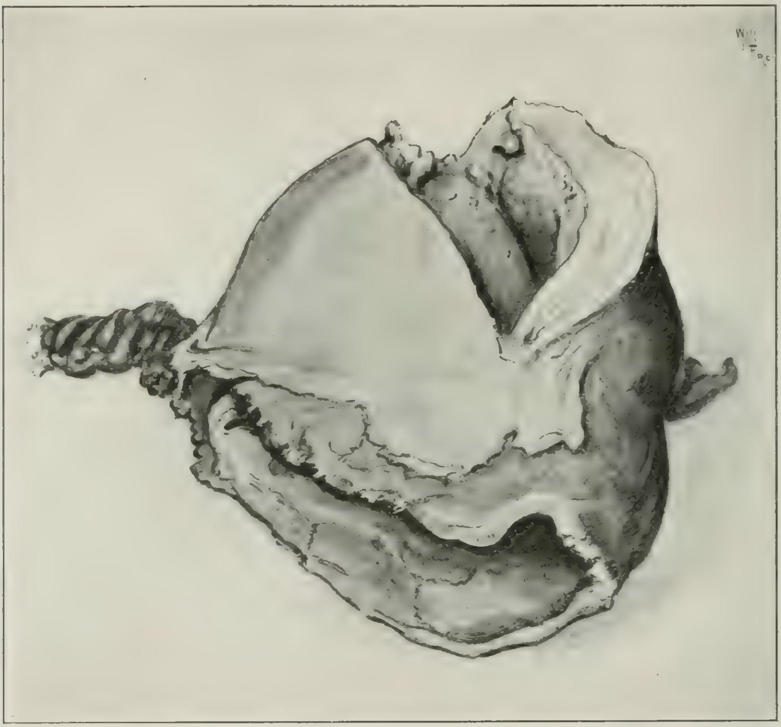

FIG. 6.—Uterus from Case V.

133 BLOOR STREET, EAST.

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PROCIDENTIA IN THE NULLIPAROUS WOMAN.*

BY

WILLIAM M. FORD, M. D.,

New York City.

(With three illustrations.)

PROCIDENTIA in a nulliparous woman, while not common, would seem to be encountered sufficiently often to warrant the development of an appropriate operative technic for its cure. Keppler, of Boston, in 1911, reported 150 cases collected from all sources. While the writer has seen several cases of this nature he bases his present observations largely upon two cases which presented themselves for treatment in September, 1916.

Misgivings as to whether the topic was one which would interest this Society were in a measure quieted when an inspection of the meager literature on the subject revealed that at least eleven, and probably more, of our members had had some opinion on the subject already committed to print.

The important etiological factors seem to have been: increased abdominal pressure induced by hard work or tight lacing, stretching of the fascia underneath the base of the bladder, a procidentia, the evolutionary result of a cystocele which appeared early, and which was followed, in time, over the perineum by the cervix, the cervix in turn being followed by a rolling out of the posterior vaginal wall. The rectoceles were not noticeably large. If the uterus was replaced the appearance of the vulva was substantially normal. When the prolapse was artificially induced the cystocele and cervix were delivered over the perineum in much the same manner as the fetal head is normally expelled.

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* Read at a meeting of the New York Obstetrical Society, May 8, 1917.

The indications therefore, were: first, to procure especially firm support anteriorally at the vulvar cleft; second, to maintain a canal discharge of uterine secretions; third, to maintain a potential capacity for reproduction. My endeavors to meet these indications resulted in an operation a brief description of which follows.

First Stage.—The cervix is grasped with a double tenaculum and drawn well down. A transverse incision is made at the cervico-vaginal junction halfway around the front of the cervix, the anterior margin of the wound is grasped with "T" clamps and the point of a pair of dissecting scissors is thrust beneath the mucous membrane of the anterior vaginal wall forward to a point opposite the internal urethral orifice. The scissors are then spread and withdrawn, and the loosened mucous membrane divided from the cervix to a point opposite the internal urethral orifice (Fig. 1). These vaginal flaps are then dissected from the surrounding tissue by stripping with a gauze-covered finger. The ball-like bladder then protrudes through the wound (Fig. 1, *A*). The vesico-uterine ligament is next cut and the bladder stripped from the anterior face of the uterus until the peritoneal fold between the uterus and bladder is readily visible, when the bladder can be easily pushed out of sight behind the pubes. The entire wound is then packed lightly with gauze, to control the oozing, and the cervix placed within the vagina.

Second Stage.—The second stage of the operation is now begun. Hooks are placed on either side of the fourchette and separated in such a manner as to render taut the posterior margin of the vaginal entrance (Fig. 1, *GG*). This taut strip of muco-cutaneous tissue is picked up with a pair of tissue forceps and cut away. Two "T" clamps are then applied to the margin of mucous membrane, both are grasped in the left hand and held upward while the right hand covered with gauze, strips a triangular flap of the posterior vaginal wall from the underlying tissues to render easily accessible the levator ani muscles (Fig. 3, *B*). This is sometimes facilitated by plunging a pair of dissecting scissors into either angle of the wound just beneath the vaginal mucous membrane spreading their points and withdrawing them. The muscles are then grasped on either side by double volsella and drawn well forward and toward the midline, a second, and sometimes a third application of the volsella on each side is required to exhibit them well. When the levator on each side has been well mobilized the next step of the operation is undertaken.

Third Stage.—The gauze packing in the anterior wound is removed. The left index-finger is inserted into the opening in the anterior vaginal wall and carried outward and backward and to the

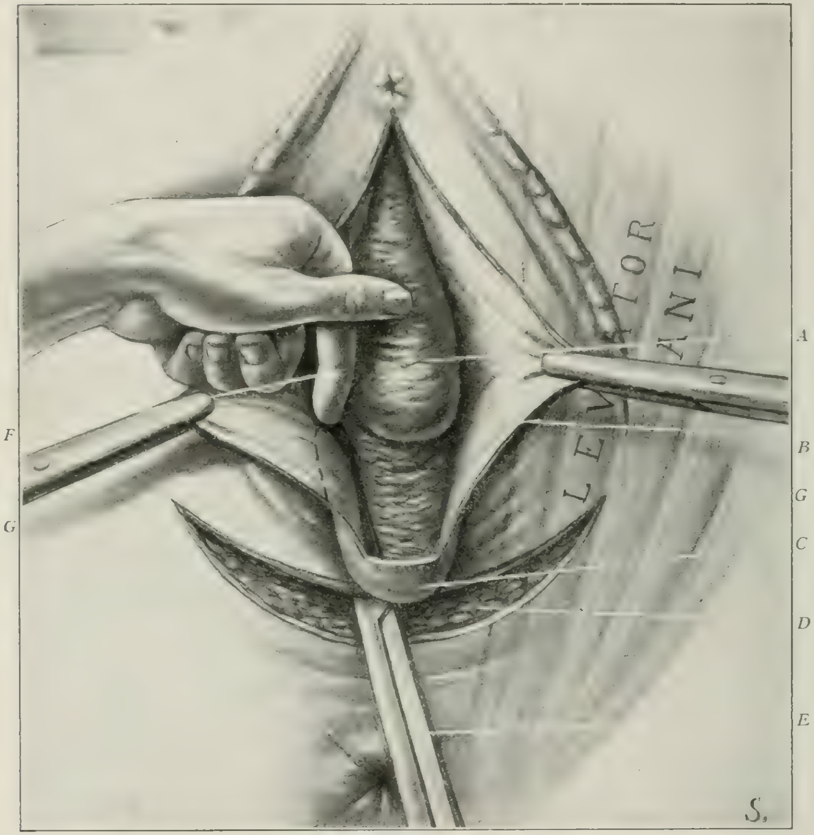

FIG. 1.—*A*, Bladder. *B*, Mucous membrane of anterior vaginal wall. *C*, Cervix. *D*, Wound made in second stage of operation. *E*, Scissors introduced in third stage of operation. *G*, Points at which hooks are applied when beginning second stage of operation.

patient's right (Fig. 1, *F*) around the vagina until it comes in contact with a pair of dissecting scissors which are simultaneously passed through the posterior vaginal wound and carried outward to the patient's right (Fig. 1, *E*) and forward about the vagina. When the two come in contact the blades of the scissors are separated, thus establishing a communication between the anterior and posterior incisions. The same procedure is repeated on the opposite side so that for a short distance the entire vaginal circumference is freed from underlying tissue.

Into the wound in the anterior vaginal wall is then passed a double French hook which is carried to the patient's right outward and backward, around the vagina and through the opening of communication into the posterior wound where it grasps the margin of the levator ani muscle on that side. The instrument is then withdrawn, and with it, into the anterior wound is drawn the anterior portion of the levator of that side (Fig. 2, *B*). The same procedure is repeated on the opposite side. A medium-sized kangaroo tendon threaded on a sharply

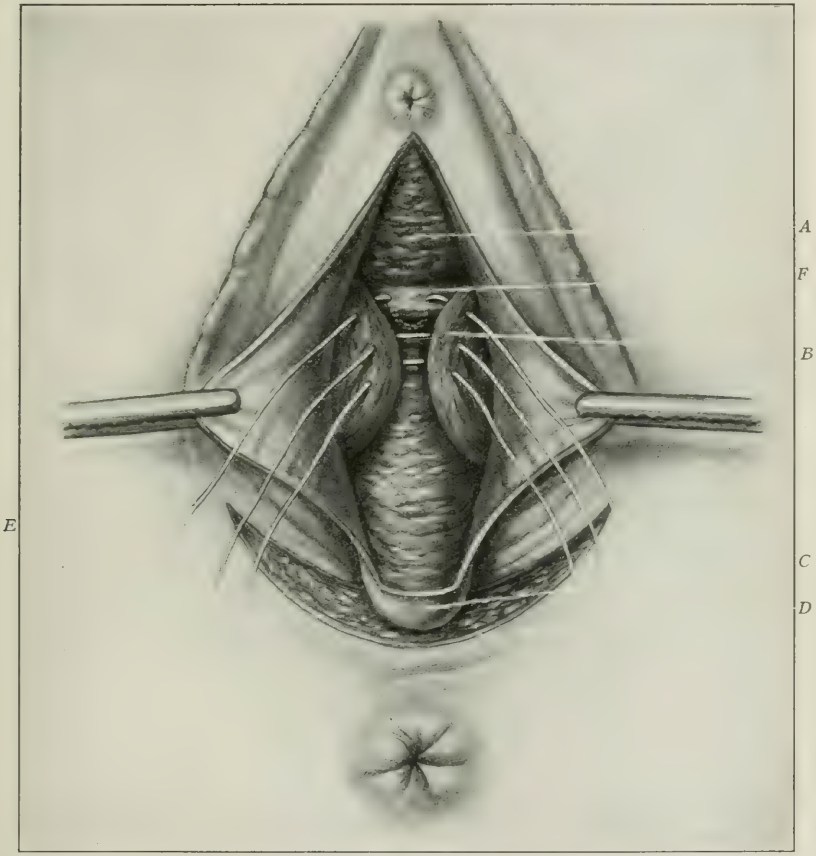

Fig. 2.—*A*, Bladder. *B*, Levator ani. *C*, Cervix. *D*, Wound made in second stage of operation to expose levators. *E*, Suture passing through anteriorly displaced levator ani, peritoneal fold between bladder and uterus, uterus and levator on opposite side. *F*, Peritoneal fold between bladder and uterus.

curved round pointed needle is next passed through the left levator ani muscle from without inward, then through the double fold of peritoneum (which was exposed when the bladder was dissected free) into the uterus and back through the peritoneal folds and then inserted into the margin of the right levator muscle from within

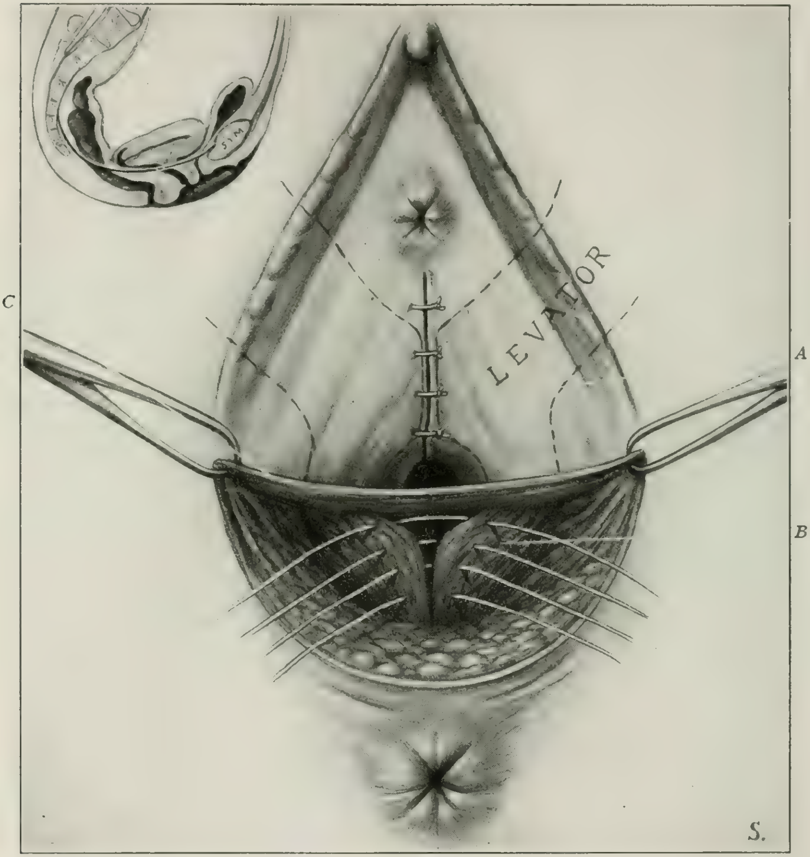

FIG. 3.—*A*, Levator ani united in front of vagina and covered with mucous membrane. *B*, Levator ani sutured behind vagina. *C*, Mucous membrane of posterior vaginal wall.

outward (Fig. 2, *E*). Two or three such sutures are sufficient; the ends which protrude through the opening in the anterior wall of the vagina are clamped and laid aside and the French hooks removed. The bladder (Fig. 2, *A*) is held by a sponge stick in its forward position behind the symphysis while a buried purse-string suture of chromic gut No. 2 closes in the loose tissue about its base. The cervix is then withdrawn from the vagina. Any excess of vaginal mucous membrane is now cut away, and the cut edges of mucous membrane are approximated from side to side with interrupted No. 2 chromic catgut sutures from behind forward to a point opposite to where the kangaroo tendon sutures emerge. When this point is reached the kangaroo sutures are tied. To do this in such a manner as to approximate the levator ani muscles below the bladder and uterus and above the anterior vaginal wall it is necessary to replace the cervix within the vagina. The remainder of the anterior wound is then closed with interrupted No. 2 chromic catgut sutures (Fig. 3).

Fourth Stage.—Through the posterior wound the levator ani muscles are again grasped and held with volsella until sutured with medium kangaroo tendon mounted on a full-curved round pointed needle; about four interrupted sutures passed from side to side are sufficient (Fig 3 *B*). The top stitch when tied should be sufficiently high to constrict the vaginal orifice which is then completely sur rounded by the levator muscles. The volsella are then removed but the kangaroo sutures are not tied until later.

The triangular flap of mucous membrane which was stripped from the posterior vaginal wall (Fig. 3, *C*) is then cut away, and the mucous membrane at the apex of the denuded triangle is drawn down until it reaches the hooks which were placed upon the lateral extremities of the fourchette, and the edges of mucous membrane thus approximated are sutured with running stitches of No. 2 chromic catgut; one suture in each angle and the hooks removed. The remaining kangaroo tendon sutures are next tied. The vaginal canal is now so constricted at the outlet that it will just admit the tip of the index-finger, and the uterus should rest horizontally above the united levators. Two or three silkworm-gut sutures are next passed in through the skin, perineal connective tissue, and surface of the levator ani muscle on one side and out through tissues on the opposite side in the reverse direction. Before these are tied a continuous suture of catgut closes the skin from the fourchette backward toward the anus. The silkworm-gut sutures are then knotted very loosely in order to provide against "cutting in" when the tissues swell and the operation is complete.

In the hands of one familiar with plastic work the operation should not consume over thirty-five minutes: it provides pelvic support from about opposite the internal urethral orifice backward to the anus, which is uninterrupted, save for the opening opposite the vagina which will not admit the index-finger; it conserves the continuity of the vagina, thus providing for the exit of uterine secretions. The potential capacity for reproduction is not destroyed although the possible necessity for episiotomy is conceded. It is a procedure which I have found useful in certain parous women presenting a similar pathology.

16 West Fifty-fourth Street.

REPORT OF A CASE OF ANTEPARTUM MAMMARY HYPEREMIA DUE TO UNRECOGNIZED MALIGNANT DISEASE.*

BY

GEO. W. KOSMAK, M. D.,
Attending Surgeon, Lying-In Hospital,
New York City.

(With one illustration.)

My purpose in reporting this case is to call attention to a most unusual antepartum condition. In this instance the cause of the same was not elicited until after the delivery of the patient, although there were several features suggesting a possible malignancy which, however, could not be localized. The unusual character of the case prompts me to place it on record although incomplete and to call attention to the underlying causes of such disturbances.

The patient, Mrs. M. C., aged thirty-two, born in this country, was admitted to the Service of Dr. A. B. Davis at the Lying-In Hospital, January 10, 1917. She had had one child after a difficult labor in 1913, and the only other noteworthy thing in her previous history was the statement that she had had alternating attacks of obstinate constipation and dysentery for several years. Her last menstruation was dated May 28, 1916, and she applied for admission to the hospital because of a severe pain in the back and abdomen during the previous month. She said that her bowels were obstinately constipated and she suffered from heartburn and eructations. She also observed during the past month that her breasts became enlarged and were painful.

Examination on admission showed a rather emaciated anemic woman. Both breasts were greatly engorged, tender and painful, with marked enlargement of the veins over the entire chest, neck, upper arms and abdomen. The breasts were firm and lumpy in places, suggesting the appearance associated with the ordinary caked breasts. The skin was tense, smooth, not inflamed. There was no fluctation present and nothing to be felt in the axillæ. The abdomen was moderately distended with gas above the uterus, which was apparently the size of a seven months' pregnancy; fetal heart present in the lower abdominal segment. The vaginal examination was negative and nothing abnormal was found in either the heart or the lungs. The patient was put to bed and after the intestinal tract was cleared out and a restricted diet given, she felt somewhat better. Stupes to the breasts were also applied but had no effect on the condition. A week later she felt stronger and was allowed to get up. She still complained of the gas distention and epigastric distress. There was no vomiting at any time. Although we believed that the pregnancy was responsible for some of her symptoms, we hoped to carry her along until the fetus was further developed before inducing labor. Malignant disease in the mediastinum was

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* Presented at the Annual Meeting of the New York State Medical Society, April 24, 1917, and at the Meeting of the New York Obstetrical Society, May 8, 1917.

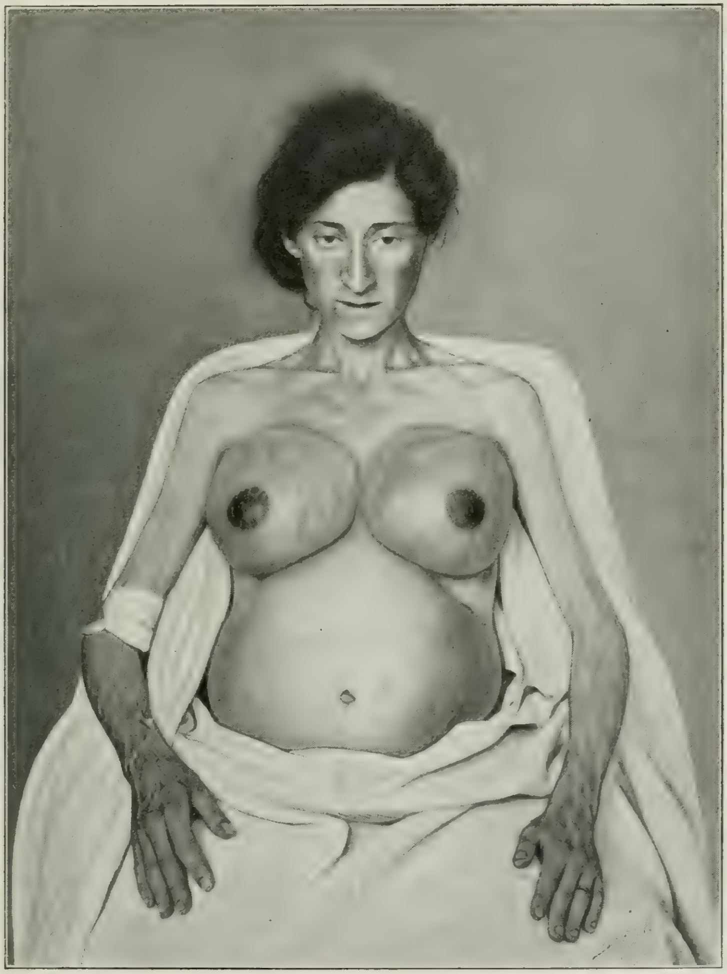

FIG. 1.—Case of pronounced antepartum hyperemia of both breasts. (From a photograph.)

considered as a source of the venous obstruction but several *x*-ray pictures of the chest proved negative. The patient continued to lose weight and her appetite was very poor. We were preparing to induce labor on February 14, when the patient began to have pains spontaneously and delivered herself the next day of a premature baby, which lived. After this she felt somewhat better but the breast condition remained the same. The gas distention was very marked during the next few days and abdominal palpation was impossible. On February 18, after vigorous catharsis, the distention was relieved sufficiently to permit us to palpate a hard oblong tumor in the right hypochondrium which measured about 8 × 2 cm. It was freely movable and apparently attached to the intestines and could not be felt before delivery because of the situation of the uterus evidently in front of it. Several weeks previously a small lump was felt near the umbilicus which was movable and apparently in the omentum or abdominal wall. Palpation in the region of the pylorus failed to disclose any mass nor could anything be felt in the region of the gall-bladder. The liver, however, seemed to extend below the usual limits. A diagnosis of carcinoma originating probably in the stomach with metastases in the mesentery, the liver, and perhaps in other locations including the mediastinum was tentatively made. The patient's condition forbade any operative procedure. On February 19 she seemed to grow very much weaker and went into a state of coma during which she died about 2 A. M. on February 20.

These are the essential features in the history of a rather puzzling case in which the outcome would probably have been the same even if an earlier diagnosis had been possible. Unfortunately we were unable to obtain consent for an autopsy. The baby weighed 2050 grams, was put on the bottle and aside from a sudden rise of temperature to 103° F., on the sixth day, presented nothing abnormal.

A moment's attention may be directed to the laboratory findings in the case. Blood examination made at intervals showed a moderate anemia, the red cells numbering about 3,700,000 with a hemoglobin of seventy and no leukocytosis. The urine showed a rather high specific gravity with a faint trace of albumen and a few casts at the time of admission. The Wassermann reaction was negative, examination of the sputum showed no tubercle bacilli but an examination of a stool made on February 19 showed occult blood present with a guaiac test. This finding is of some interest.

Pregnancy associated with neoplasms is not an unusual complication but in most cases we are dealing with benign tumors derived from one of the pelvic organs which are of interest to the obstetrician largely because they may bring about a dystocia. Postpartum degeneration of fibroids of the uterus may also occur and prove a source of danger from sepsis. Malignant neoplasms which develop during pregnancy are rather uncommon and aside from cases of carcinoma of the cervix we rarely hear of them. DeLee states that among 19,400 consecutive obstetric cases at the Chicago Lying-In Hospital only one was complicated by carcinoma of the cervix. J. W. Markoe in a statistical study of 60,000 labors at the New York Lying-In Hospital reports two deaths from carcinoma of the cervix, one from sarcoma of the ovary and one from visceral sacroma. Dr. A. B. Davis has also reported a general sarcomatosis complicating pregnancy, but aside from this there are no other cases of malignancy reported from the above institution. Malignant neoplasms of the ovary were found in 5 per cent., out of a series of 862 cases collected by McKerron. Hirst in his text-book mentions sarcoma and carcinoma of the pelvis among malignant growths obstructing labor and also refers to the fact that mammary tumors, especially adenomata, may take on a very rapid growth during pregnancy and become so engorged and painful during lactation as to require removal. He also states that true mammary carcinoma may appear in fulminating form late in pregnancy or the puerperium. New growths originating in the fetal ectoderm, such as chorioepithelioma and hydatid mole, and those arising in the mesoderm, such as placental sarcomata may be mentioned as among malignant processes directly connected with pregnancy but obviously need not be considered in this report. The case herewith noted is, therefore, of particular interest on account of its course and rarity, and it is a matter of regret that fuller confirmation of the diagnosis could not be obtained by autopsy. We were dealing with a pregnant woman admitted to the hospital because she had painful breasts that had become so during pregnancy. Although the most prominent symptom pointed to an obstruction of the venous circulation, careful physical and *x*-ray examination failed to disclose any clue to the same. Considering for a moment the mammary circulation we find that the arteries are supplied by the axillary, internal mammary and intercostals. Some veins end probably in the axillary and internal mammary trunks, the others enter into the intercostal veins. These are tributaries of the innominate veins and a mediastinal mass pressing on both would probably constitute a sufficient obstruction, as in our case. The nature of the same can only be guessed at, but in view of the progressive character of the symptoms and the absence of temperature or other evidences of an inflammatory process, a mediastinal abscess could be ruled out. Aneurysm was considered but eliminated as the cause of the disturbance. Sarcoma in this region has been reported as coming from the lymphatic glands or the periosteum of the sternum or vertebræ. If deeply situated it may exert pressure on the superior vena cava and the innominate veins sufficient to cause a decided edema of the upper limbs and thorax, but this was not present in our case. The finding of an intra-abdominal mass in the upper abdomen after delivery as already noted, makes it probable that an intestinal carcinoma may have been the primary focus, especially as we had a previous history of some obscure intestinal disturbance marked by alternating periods of constipation and diarrhea. A rapid extension of the malignant process marked by a localization in the mediastinal lymph nodes occurred during the pregnancy and produced the prominent symptom, namely, mammary hyperemia. When first seen we thought, among other things, that it might be due to some disturbance in the relations between the internal secretory glands, but the associated progressive emaciation and pain, together with the subsequent findings precluded this.

It seems to the writer that the occurrence of a progressive mammary hyperemia during pregnancy should lead one to consider the possibility of a process similar to that observed in this case and a guarded prognosis given as to its subsidence and recovery. The induction of labor as soon as the child is viable will undoubtedly contribute much to the immediate relief of the mother, but aside from this the condition appears hopeless.

23 East Ninety-third Street.

REPORT OF A CASE OF PAPILLO-CYSTOMA OF THE OVARIES.

BY

A. PESKIND, M. D.,

Cleveland, Ohio.

(With two illustrations.)

Mrs. Anna S., aged forty-eight years, mother of four children, all living, has been ill three years with distress in the abdomen, the latter gradually increasing in size. Her trouble was variously diagnosed by different medical men. Dr. Davidson of Pittsburgh, who last examined her, diagnosed it as an ovarian cyst and referred the case to me. The patient was admitted at the East 55th Street Hospital, January 17, 1917. Upon examination of the patient the following day, all her viscera were found normal, except in the retrouterine space a hard unyielding mass was easily discernible. The size of the mass could not be defined because of the very tense abdomen, distended with fluid. Papillo-cystoma of the ovaries was diagnosed. In the morning, January 19th, the patient was operated upon.

The abdomen was opened with deliberate care. When the peritoneum was reached its unusual resistent, thickened structure, extremely tense, as if ready to burst at the slightest touch, added to my wariness. It was soon discovered that the thickening was due to the inseparable adherent omentum, which was continuous throughout the whole length of the incision, from the umbilicus to the symphysis pubis. A small opening was made through the thickened mass and the opening gradually enlarged until a large blunt trocar could be snugly inserted in the opening to relieve the tension from the ascitic fluid. Seven and a half gallons of dark, grumous fluid were tapped off. The finger was then introduced into the wound and the cavity explored to ascertain the position of the intestines. The incision was then enlarged, the adherent omentum divided between hemostats. A large sac was exposed, perfectly smooth throughout, walling off the abdominal cavity. The sigmoid to the left, the small intestines and transverse colon above could be felt adherent to this sac. The viscera were well excluded.

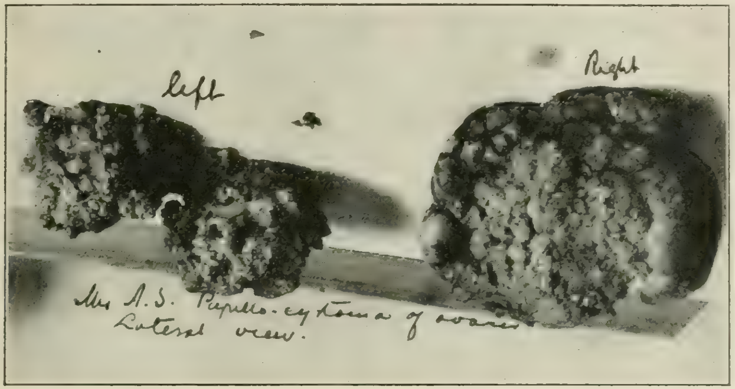

FIG. 1.

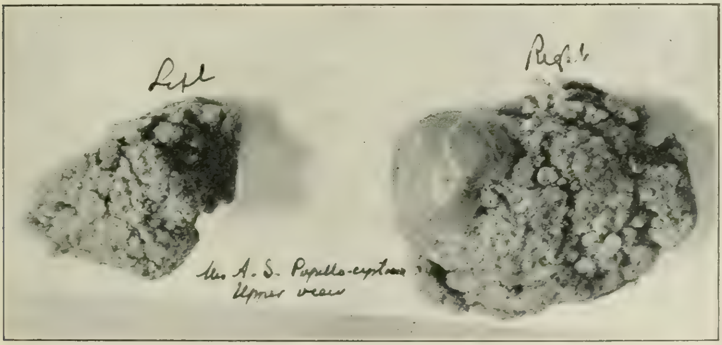

FIG. 2.

Reaching down with the finger toward the pelvis both ovaries were felt covered by a papillo-cystomatous mass lying free low down in the pelvis, the new growth apparently involving no other structure. Both ovaries were removed and the structure of the sac was examined It was entirely a new formation—a protective lining which thoroughly walled off the rest of the abdominal viscera, protecting them from the warty invader. The left ovary, while somewhat enlarged, together with the bulging left hydrosalpinx, were covered in front and behind by papillomatous masses. The right ovary, rather small, and entirely irregular in outline, was overgrown by the same substance. Neither of the two ovaries entered into the formation of the sac which contained the fluid. The abdomen was closed with drainage. The recovery was rapid and uninterrupted.

I have seen several cases of papillo-cystomata of the ovaries, but never before have I noticed a sac such as contained the fluid in this case and which so thoroughly walled off all the other viscera of the abdomen. What effect will this sac have on the recurrence of the papillo-cystomatous tissue?

The pathological report by Dr. A. A. Eisenberg of the specimen is as follows:

There seems to be no normal histologically identifiable tissue; the entire section consists of a mass of fibrous tissue covered with numerous papillomatous outgrowths—the latter covered with ciliated cylindrical epithelium; the striking feature is the presence of many cavities filled partially in some places, completely in others, with warty excrescences, projecting into the lumina of the cavities within and into the stroma without; there are several growths of lime salts (psammomata) scattered through the tissues. Histologically the section is one of cystadenoma papilliferum, and because of rich cellular infiltration and intracystic growth, I believe it is a cystadenoma malignum papilliferum, which if not actually malignant is to be regarded as a forerunner of malignancy.

At this date of writing, April 30, 1917, there has been no evidence of recurrence.*

2414 East Fifty-fifth Street.

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* Note.—August 6, 1917. Mrs. S. is at present enjoying very good health. There is no evidence whatsoever of any recurrence of the growth.

SOME OBSERVATIONS ON THE AFTER-RESULTS OF THE INTERPOSITION OPERATION.*

BY

DANIEL R. AYRES, M. D.,

New York City.

My interest in the after-results of the interposition operation was aroused by an experience a few years ago. A patient came under my observation who was operated on in April, 1913, for prolapse of the third degree. The interposition operation had been done. There had been no previous inflammation of the bladder and post-operative catheterization was unnecessary. The patient was seen again in June and reported "no complaints." In October she applied for relief for the symptoms of frequency and dysuria. These subsided under medication and the patient was not seen until the following March. At this time there was a return of the symptoms in an aggravated form. In short a most severe and obstinate cystitis had developed which resisted treatment until late in the Fall. The colon bacillus was the offending organism and vaccine therapy was used, as well as local treatment. Cystoscopic examination was never satisfactorily performed on account of the intolerance of the bladder, so at that time I had no reason to consider that there was any connection between the operation and the subsequent cystitis.

More recently a number of other cases have come under my observation on whom the interposition operation had been done. In all thirty-seven cases have been examined, nearly all cystoscopically as well as vaginally. Of the entire number only sixteen were free from some undesirable symptom, although in many cases, as will be indicated, the trouble was insignificant.

In the first place nine cases of cystitis were encountered. These varied from a mild trigonitis with small amounts of pus to a severe cystitis with ulceration, considerable pus and exfoliation of epithelium. When it was possible to secure laboratory aid the cultures showed the colon bacillus, with two exceptions. In these two the infection was caused by the staphlococcus aureus. In regard to the anatomical picture, it was found that an elevation of base of the bladder was invariably present. In addition deep pockets were present on either side and behind the trigone. In some cases the pockets were so deep that it was impossible to see the ureteric orifices. Of all the cases examined only two showed this distortion of the bladder, that did not have a cystitis.

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* Read before a meeting of the New York Obstetrical Society, May 8, 1917.

Of those cases presenting themselves with cystitis following this operation, nine in number, only one gave a history of previous bladder trouble, so far as could be determined. That postoperative catheterization is always instrumental in causing the cystitis is doubtful. Several cases we know were not catheterized and so far as could be determined the only patient that had symptoms while in the hospital was the one mentioned above, who had had the previous cystitis. The other patients developed symptoms and applied for treatment anywhere from weeks to months after operation.

Cases of incontinence were observed as follows:

Incontinence a symptom before operation and cured by it.

Incontinence present before operation and persisting after.

Incontinence developing months or years after.

The developing of incontinence can hardly be foreseen as it occurs often enough independent of displacement of the bladder and uterus. However when present at the time of operation it could be cured by the procedure which bears Dr. Howard Kelly's name.

Disregarding the results concerning the bladder for the present it may be of interest to mention some of the other sequellæ.

Two cases were seen with the following picture: When the patient strained a pronounced bulging appeared at the vulva. This proved to be the fundus of the uterus apparently "taking a header" out of the vagina. The tumor was no larger than that caused by a moderate cystocele. How far the uterus could prolapse in this manner I am unable to say, but it was obvious that a source of discomfort was present, one likely to impress the patient that the operation was not a success.

Two cases were seen where there was a return of the prolapse. Apparently the uterus had broken away from the anterior vaginal wall. The bladder in these cases did not show any abnormality.

Another case came complaining of a protrusion from the vagina noticed for two months previously, the operation having occurred ten months before. Examination showed that there was a weakness in the anterior vaginal wall which allowed a small portion of the floor of the bladder, as far back as the interuteric line, to descend. The deficiency in support was very apparent on vaginal examination and the interior of the bladder showed a deep furrow. There was no cystitis present but there were false diverticuli and marked trabeculation.

By way of parenthesis, as the case is not strictly relevant, I would like to cite the following briefly:

A patient applied for treatment in August, 1916, complaining of frequency, dysuria and hematuria. She gave a history of having been operated on in May, 1916, for prolapse. Examination by vagina revealed the fact that the interposition operation had been done. Examination of the bladder showed that there was a severe cystitis present, so severe that it was only after repeated washings that a satisfactory picture was obtained. Later when the bladder was in fair condition, it was discovered visually what had been apparent on palpation, namely a stone. It was decided to clear up the inflammation as much as possible before attempting to remove the stone, the removal being deemed impossible by any route other than the supra-pubic. Irrigations and vaccine therapy accomplished a great deal and in January, 1917, the bladder was opened. There was considerable speculation as to the origin of the stone. Whether it was present before operation; whether it had formed around a suture, or whether it was a result of distortion of the bladder and subsequent infection. As a matter of fact the stone had formed around a gauze sponge that had ulcerated into the bladder, presumably having been left in the incision in the anterior vaginal wall.

Since then two cases have been encountered where stones had formed in the bladder independent of foreign bodies.

Another complaint met with following the interposition operation was dyspareunia. Some volunteered the information, others admitted it on questioning. The cause was obviously due to a shortening of the vagina, rather than to a tight perineum.

I have had no experience with operations for prolapse involving hysterectomy, but two cases were encountered where the removal of the uterus would have been preferable to the interposition operation. One was a woman of fifty who was still menstruating regularly and profusely up to the time of operation. The interposition operation was done and when seen a year later the patient was still bleeding profusely and as often as every two weeks. The anatomical result was excellent. Another patient had a temporary cessation of profuse bleeding after the operation but lately has started up again.

An analysis of the total number of cases examined is as follows:

Cystitis	9
Prolapse of fundus	4
Recurrence	2
Incontinence	3
Persistent bleeding	2
Separation of anterior vaginal wall	1
	21

Making a total of twenty-one cases out of thirty-seven with unfavorable results.

Considered from an anatomical result the appearances are better. Thirty out of the thirty-seven could be said to have a perfect cure of rectocele, cystocele and prolapse.

One very significant fact is that out of the total of twenty-one unfavorable cases eleven occurred in patients operated on for complete prolapse. Out of the nine cases of cystitis five occurred in such individuals. All the cases that had poor anatomical results, that is, seven, occurred in those operated on for complete prolapse.

In all thirty-seven cases, eighteen were operated on for complete prolapse, and there were unfavorable results in twelve, a percentage of 66⅔. These unfavorable results were as follows:

Cystitis	5
Recurrence	2
Prolapse of fundus	4
Separation of anterior vaginal wall	1
	12

I feel that an apology is due as I have little constructive criticism to offer. The cases seen in the dispensaries do not represent a series of cases. The cases seen with unfavorable results that have chanced to come under my observation represent a very small fraction of the total number of interposition operations that have been performed. It may be that the percentage of recurrences and other undesirable conditions is no greater than one should expect after hernia operations, for instance. But one cannot help being impressed with one's own experience. To see the almost intractible cases of cystitis is enough to discourage one from recommending the operation.

I believe that in order to reduce the chances of a subsequent cystitis to a minimum, it is necessary to have the floor of the bladder in a smooth condition, approximating as nearly as possible the normal relations. To avoid the bulging of the fundus in the floor of the bladder it may be necessary to reduce the size of the uterus. To avoid the pocketing of the ureters and the lateral depressions it is necessary to see that the bladder is well pushed up laterally. The occurrence of bladder distortion without cystitis was rare.

In conclusion, I believe that the interposition operation has special indications.

Obviously it is an unwise procedure during the child-bearing age.

It is indicated in the lesser degrees of prolapse with cystocele.

It is contraindicated in prolapse of the third degree.

When fibroids are present or a condition of fibrosis is suspected, denoted by profuse, irregular bleeding, hysterectomy should be performed and the other indications met.

When the operation is indicated, large uteri should be reduced in size and an effort be made to keep the bladder floor level.

One should not hope to cure incontinence without strengthening the sphincter of the bladder.

Finally a plea is made for cystoscopic examination before and after operation, as well as careful urinalysis.

POSTOPERATIVE TREATMENT OF VESICOVAGINAL FISTULÆ.*

BY

CHARLES G. CHILD, JR., M. D.,
New York City.

In the after-treatment of cases operated upon for vesicovaginal fistula the detail of greatest importance is the prevention of distention or overdistention of the bladder. Obviously the only way in which this can be obtained is by keeping the bladder empty, or nearly empty. To accomplish this catheterization is necessary. There exists much difference of opinion as to whether the catheterization should be accomplished by means of a self-retaining catheter or by frequent catheterizations carried out by the nurse in charge. From my own experience the self-retaining catheter with continuous drainage is the most certain. Emmet employed a self-retaining catheter for ten to fourteen days, but many operators now advocate catheterization every two to three hours for the first few days only, and some even go so far as to state that the self-retaining catheter should never be used.

As patients vary greatly as to the amount of urine which they secrete in any specified time the prevention of overdistention of the bladder becomes more or less a question of uncertainty if it is only emptied at stated periods.

I have never found any objection to the use of the self-retaining catheter, except the discomfort which it causes the patient during the first few days. After this they readily become accustomed to its presence and the bladder tolerates it with little or no evidences of irritation. Occasionally, however, the formation of urinary salts quickly blocks the lumen of the catheter, so that it must be frequently removed and cleaned.

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* Read before a meeting of the New York Obstetrical Society, May 8, 1917.

As I have said above, the one great danger in preventing successful results after the operation is undue tension on the sutures from overdistention of the bladder. Many of the smaller fistulæ would close spontaneously if this overdistention were prevented. The following case is a good example:

Mrs. A. M., aged twenty-three; small vesicovaginal fistula ½ inch in diameter, of one year's standing. On the fourth day after operation the catheter was removed and cleaned. Through carelessness in its reintroduction it was pushed through the wound into the vagina, thereby opening up the fistula again and tearing out the sutures. The fistula was not resutured, and the bladder drainage was continued for twenty-one days. The fistula closed spontaneously at the end of six days, and a perfect cure was obtained.

Another similar case is Mrs. T., aged forty-seven years, fistula 1 inch in diameter. Self-retaining catheter with continuous drainage. On the sixth day after operation the catheter became blocked, there being no drainage for six hours. At the end of this time the patient made violent efforts to empty her bladder, broke open the fistula and discharged the urine through the vagina. The catheter was removed and cleaned and reintroduced, but for twenty-four hours all the urine drained through the fistula. Gradually, however, the leakage become less, until it finally ceased on the tenth day. On the fourteenth day the catheter was removed, and the patient voided normally thereafter.

In both of these cases considerable trouble was caused by the encrusted urinary salts, so that the catheter had to be removed almost daily. At the time the one broke down the fistula admitted readily the index-finger—a large opening to close spontaneously.

A difficult form of fistula to close spontaneously is where the fundus of the bladder prolapses through the fistula into the vagina. This complication is, as a rule, only met with in fistulæ of large caliber—2 inches or over. In these there is a tendency on the part of the bladder fundus to break down the suture line. The fundus lying in contact with the wound presses forcibly against it each time the patient strains, coughs or vomits, so that, unless the fundus can be kept away from the wound, an unsuccessful result is liable to obtain. In these cases the patient, for the first week, should be kept in the Trendelenburg position, with just enough urine in the bladder to gravitate the fundus away from the operation wound—somewhat difficult of accomplishment except by the use of a special bed. A case in point is as follows:

Mrs. C., aged thirty-one years; fistula, sixteen months old. In this case the opening was 2½ inches in diameter, and the fundus of the bladder prolapsed through and out at the vaginal opening, and presented several small abrasion ulcers from the friction of the patient's clothing. After operation the Trendelenburg position was maintained for ten days and continuous drainage, by a self-retaining catheter, for fourteen days. After removal of the catheter the patient voided within the first two hours, and normally thereafter every three to four hours. The sutures were removed on the twenty-first day.

Briefly, I would summarize the treatment which has given me the best results as follows:

A rubber self-retaining catheter with continuous bedside drainage. I believe it is better and more certain to make this drainage continuous rather than to open the catheter at stated intervals. The bladder readily tolerates this form of drainage, and it can be continued from two to three weeks, or even longer, without causing any intolerance on the part of the bladder, or any infection. In several of my cases this form of drainage has been carried out for four weeks. After the second or third day a daily irrigation should be given, to keep the catheter open, and to remove any blood-clots or sediment which may have collected in the bladder. Every three to four days the catheter should be removed, and freed from all encrustations. As a rule the formation of urinary salts on the catheter gives little trouble, unless the urine is alkaline. Benzoate of sodium, in 5-grain doses three to four times a day, or Emmet's prescription:

℞. Acid benzoici	ʒij,
Acid borici	℥iij,
Aqua. cinnamonis	℥xij.

M. Sig.—ʒij in water four times daily.

will keep the urine sufficiently acid to prevent any undue encrusting. In cases of large fistula, with prolapse of the bladder through the opening, the patient had better be kept in the Trendelenburg position, or at least with the hips well elevated, for the first week or ten days. The catheter may be removed on the fourteenth day, provided the patient voids, or is catheterized every two to three hours for the following week. We should not lose sight of the fact that in many of these cases of long-standing the bladder, from disuse, has atrophied and become so small that it will hold hardly a few ounces of urine; and in these contracted bladders it will be some time before the patient will be able to go more than two or three hours between urinations. Of interest in this connection is the following:

Mrs. M. B., aged thirty-eight years; fistula of long standing. The bladder was so atrophied that when the operation was completed it was possible only to introduce an ounce and a half of irrigation. Two months after operation the bladder held only 4 to 5 ounces. The patient had to void every hour or two during the day and night. Five months after operation, however, as high as 18 ounces of urine was drawn from the bladder by catheterization. This case well illustrates the marvellous adaptability on the part of nature in reëstablishing the function of an organ atrophied from long disuse.

After the catheter is removed the patient may be allowed out of bed, and the sutures can then be removed.

I am fully aware that the consensus of opinion to-day in the postoperative care of these fistula cases is toward a shorter convalescence and an earlier removal of sutures than I have advocated. However, as I said when I began, the one most important factor is to prevent the breaking down of the wound before permanent union has taken place.

Infection, except where catgut has been used in the repair, is a rare complication, and overdistention of the bladder in the first week after operation is responsible for the greatest number of failures that have come to my attention.

Emmet drained his cases ten to fourteen days; took the stitches out on the tenth day, kept the patient in bed until the twentieth day, and I know of no one who has had better success than he.

163 East Seventy-first Street.

GAS BACILLUS INFECTION; REPORT OF A CASE OF ACUTE ENDOMETRITIS AND SEPTICEMIA FOLLOWING PARTURITION; DISCUSSION; RESEARCHES IN WAR ZONE.*

BY

STUART GRAVES, M. D.,

Louisville, Ky.

Fatal infections with bacillus aerogenes capsulatus, commonly called Welch's "gas bacillus," are not uncommon. Usually they have been associated with crushing injuries into which some earth has been carried. During the present war the organism has infected many shot wounds. A moderate number of cases have been reported of puerperal sepsis and of sepsis following abortion either caused by the bacillus or in which it played an important rôle. These have been studied particularly by Dobbin(1), P. Ernst(2), Graham, Stewart and Baldwin(3), and Krönig and Menge(4).

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* From the Pathological Laboratory of the Medical Department of the University of Louisville and the Louisville City Hospital.

On August 21 a patient came to autopsy (A 16–166) in our laboratory six hours postmortem. The examination by Dr. Moore did not reveal any external evidences of emphysema. The mammary glands were secreting. The stomach was markedly dilated, extending to the umbilicus. About 100 c.c. of blood-tinged fluid was found in the pericardial cavity. Numerous, fiery red, punctate areas were found in the visceral and parietal pericardium. The vessels of the epicardium were markedly distended and contained gas bubbles. The blood was thin and dark red. The myocardium was soft, flabby and crepitant. Its cut surface was pale red and presented numerous, pin-head cavities from which gas bubbled. From the lungs an excessive amount of thin, dark red, frothy blood escaped. The capsule of the spleen was tense and the organ was crepitant throughout. Its cut surface was dark brownish-red, soft and diffluent and gave off gas bubbles on pressure. The mucosa of the stomach presented dark red, pin-point areas. The liver was flabby and crepitant. On section it was soft, dark red and riddled with holes like a sponge. From its cut surface also gas bubbles escaped on pressure. Fine holes were noted in the cut surface of the kidneys from which similar gas bubbles could be expressed. The mucosa of the bladder was grayish yellow, mottled with fiery red, pin-head areas. The fundus of the uterus extended 20 cm. above the symphysis pubis and measured 6 × 10 × 20 cm. The cervix admitted four fingers. The uterine wall was 3 cm. thick and its cut surface presented numerous dilated cavities up to 5 mm. in diameter. The uterine canal contained a large quantity of foul smelling, dark red, friable material mottled with grayish-yellow material. The tubes and ovaries were negative. Anatomical diagnoses pertinent to the subject: Bacillus aerogenes capsulatus infection of blood, heart, lungs, spleen, liver, kidneys, uterus and other tissues, acute infectious endometritis, acute infectious metritis, congestion of lungs, emphysema of viscera, punctate hemorrhages of epicardium and gastric and vesical mucosæ, subinvolution of uterus, lactating breasts. Subsequent microscopic examinations showed gas bubbles in all these organs with many rod-shaped bacilli along the edges of the bubbles and masses of them in the vessels and scattered elsewhere in the tissues. There was no such evidence of injury or cellular reaction as is commonly found in most infections. In this connection the lack of pus in discharges during life from wounds infected with gas bacillus should be recalled. In the liver was some engorgement of the central vein and slight evidence of central necrosis, but practically no cellular reaction.

Bacteriology.—The bacteriology was studied by Dr. Graves and Dr. Maxwell. Cultures were taken from the heart's blood and from the spleen, liver and kidney. In taking these cultures the surface was seared with a hot iron and puncture made with a hot, pointed, scissors blade. The cultures from the heart's blood were characteristic. After twenty-four hours' incubation of an anaërobic culture on glucose bouillon, the media was cloudy and showed fine gas bubbles at the top near the wall of the test-tube and gave off a distinct butyric acid odor. A smear from this growth showed large, Gram-positive bacilli with rounded ends, a few being end to end. Four cubic centimeters of this culture were injected under sterile precautions into the heart of an etherized guinea-pig. After five minutes the animal was killed with ether, incubated at 37.5° C. for four hours and allowed to stand in a covered jar at room temperature for ten hours. A postmortem examination of the guinea-pig revealed the liver ruptured, riddled with holes and of a coarsely spongy appearance. In the fluid escaping were fine bubbles. It was the typical "foamy" liver. A culture taken from this liver under sterile precautions and incubated under anaërobic conditions for twenty-four hours showed a growth similar to that described under the heart's blood from the patient. Transplants from the glucose bouillon culture of patient's heart's blood and from the glucose bouillon culture of the guinea-pig's liver, after twenty-four hours under anaërobic conditions, acidified and partially coagulated litmus milk, at the top of which were seen fine gas bubbles and from which arose a characteristic butyric acid odor, and riddled a glucose gelatin agar shake so that part of the media was blown almost out of the tube. Smears from these cultures showed large, Gram-positive bacilli. A smear from the liver showed similar bacilli with capsules. Cultures from spleen, liver and kidneys planted on glucose bouillon (anaërobic) and transplanted on other media gave results similar to those obtained with the culture from the heart's blood. A smear from the uterus showed large, Gram-positive, rod-shaped bacilli with round ends, clear capsular zones which did not take a capsule stain with repeated attempts and Gram-positive cocci in chains up to 6 units. Smears from the culture, which was made from the endometrium when first opened, after twenty-four hours under anaërobic conditions, showed bacilli similar to those described and Gram-positive cocci in clusters and chains up to 18 units, chains predominating.

Clinical Aspects.—An excerpt from the clinical chart sent to the laboratory with the autopsy permission card follows:

R. H., aged twenty-six years. Admitted Aug. 18, 1916, at 6 P.M.; provisional diagnosis pregnancy. Died Aug. 21st at 4 A.M. Final diagnosis, pregnancy and eclampsia. History chart records: "Emergency—patient delivered with forceps and never in a condition afterward that a routine physical and history could be made." Nurse's notes: Admitted 6:15 P.M. Patient having pains every three minutes. At 7:25 P.M. delivered of living male child. Placenta delivered ten minutes later. Hot lysol douche. Parts cleansed with hot lysol solution. Sterile pad and binder applied. Fluid extract of ergot 1 oz. at 7:35. Pad changed Aug. 19th at 12:30 A.M., 3 A.M., 4:30 A.M. and 6 A.M. At 8 A.M. was given alcohol rub, irrigated with lysol solution and sterile pad applied. 7:40 P.M. dyspnea. 8:50 P.M. involuntary urination. 10 P.M. headache and emesis. 11 P.M. sleeping. 4 A.M. (8–20) sleeping. 6:30 A.M. sterile pad applied. 8 A.M. emesis of dark brown, offensive fluid. 9 A.M. lysol douche. Sterile pad applied. Lochia rubra, offensive and scanty. Involuntary urination. Emesis. 10 A.M. restless and delirious. 1:30 P.M. ice cap to head. 1:50 P.M. pulse rapid and irregular. Patient coughing much and vomiting. 3:30 P.M. breast massaged. No secretion obtained but some blood from right nipple. Blood pressure 134. 5 P.M. patient in continuous convulsions. 6:45 P.M. emesis of coffee colored fluid. Patient had one-tenth grain of morphine hypodermically. 8:30 P.M. tube inserted. 10:10 P.M. protoclysis started with Fisher's solution. 10:30 P.M. croton oil, two minims. 12:20 A.M. (8–21) bloody fluid expelled. 1:15 A.M. Fisher's solution, 350 c.c., given intravenously. 4 A.M. ceased to breathe. Urine (8–21): Dark straw, cloudy, acid, 1.026, albumin positive, sugar negative, no casts. Temperature not recorded until 12:30 A.M. Aug. 19th when it was 98.6. At 1:30 A.M. (8–20) it jumped to 100.4. Continued high, rising to 101 (axillary) at 1:50 P.M., 102.4 at 4.30 P.M., 105 (axillary) at 3:40 A.M. (8–21). Pulse not recorded until 12:30 A.M. Aug. 19th, then 128, rose to 140 at 7:40 P.M., 160 at 1:30 A.M. (8–20), 150 at 9 A.M., (8–21). Respirations not recorded until Aug. 19th at 12:30 A.M. when they were 30, rose to 44 at 1:30 A.M. (8–20) and continued 44 to 52 until death. Chart states baby was asphyxiated at birth. Artificial respiration administered. Died Aug. 19 at 10 A.M.

DISCUSSION.

This case offers several points of interest for study. The frequency of bacteremia due to bacillus aerogenes capsulatus seems to settle the question of the invasion of the human body during life by this organism. Baugher(5) reported five cases of infection in males all of which gave positive blood cultures yielding bacillus aerogenes capsulatus. Three of these patients recovered. The report was made to prove that it was possible to demonstrate the organism by means of blood cultures in severe infections due to it and yet obtain recovery if proper surgical treatment was applied. Baugher was of the opinion that gas was not formed in the circulating blood during life, confirming previous conclusions of Simon Flexner(6) and Gwyn(7). In 1899 the latter had reported recovery of the gas bacillus three times from the same patient before death, the first time thirteen days antemortem. In 1909 Rhea and Young(8) reported two cases of gas bacillus infection following abortions, one of which gave a positive blood culture eighteen hours before death. This paper is of particular interest because Young states that "the entire body was puffy and over the chest, arms and legs a fine crepitus was obtained on pressure—in fact, the patient could hardly open her eyes." Two years later Hewitt(9) reported ten cases in four of which he obtained antemortem blood cultures yielding gas bacillus. All four patients died. Only one autopsy was secured and this revealed the usual postmortem lesions in gas bacillus infection.

Concerning pathogenesis, McFarland(10) says, "The pathogenic powers of the bacillus are limited and, while in some infected cases it seems to be the cause of death, its power to do mischief in the body seems to depend entirely upon the preëxistence of depressing and devitalizing conditions predisposing to its growth. Being anaërobic, the bacilli are unable to live in the circulating blood, though they grow in old clots and in cavities, such as the uterus, etc., where little oxygen enters, and from which they enter the blood and are distributed."

Hiss and Zinsser(11) say concerning pathogenicity: "Thus, while the Welch bacillus may unquestionably invade the human body and do much injury, and even be regarded in many cases as probably the direct cause of death, its invasion in many of these cases must be regarded as not a primary invasion, but as one associated with and made possible by either traumatic injury or the coöperation of other invasive germs such as streptococci, staphylococci and others. There may, of course, in addition to these be rare instances in which the Welch bacillus, owing to excessive virulence of the strain or relatively low resistance of the infected individual, becomes the primary invader."

McCampbell(12) thinks that the toxic substance produced by the bacillus does not act directly like true bacterial toxins, but indirectly through the generation of organic acids (*e.g.*, butyric acid), which are immediate injuries to the tissues. The bacilli seem to act particularly on the muscles. Kendall(13) states that the gas bubbles found in the blood stream and in the muscles and particularly in the liver are the result of the decomposition of the muscle sugar and glycogen by this organism. Whether or not gas is formed by this organism in the circulating blood during life, there is no doubt that gas is formed by it antemortem in the tissues. The case reported by Rhea and Young indicates this fact. "At times," says McFarland, "as in a case of Graham, Stewart and Baldwin, there is no doubt but that the bacillus produces gas in the tissues of the body during life. These observers, in a case of abortion with subsequent infection, found the patient 'emphysematous from the top of her head to the soles of her feet' several hours before death. In this case, in which the bacillus was found in pure culture, it would indeed be difficult to doubt that the fatal issue was due to bacillus aerogenes capsulatus."

DeLee(14), in discussing puerperal infection, says: "If it (B.A.C.) invades the tissues these become emphysematous and gangrenous; in the blood the vessels are full of frothy fluid and the liver and spleen become spongy with gases. The body swells up with general emphysema and there are hemorrhage and icterus. Some cases of so-called air embolism are really infections of this sort."

In a case of gas bacillus infection reported from this laboratory by Moore(15) at a meeting of the Jefferson County Medical Society last June it has been possible to study infected tissue removed during the life of the patient. A hand had been infected by a bullet wound and the arm was amputated. In sections the organisms are numerous and the gas spaces can be seen, some in living muscle, but mostly in necrotic tissue. The identity of the organism was proven with cultures and animal inoculation. The man recovered. Fortunately these recoveries are becoming more frequent as the result of earlier diagnoses made with the help of bacteriological examinations and as the result of prompt radical and modern surgical treatment. Recoveries have also been reported by Robertson(16), Blake and Lahey(17), Fauntleroy(18) and others.

Researches in the War Zone.—Since the preceding portion of this paper was written interest in gas bacillus infection has been stimulated by the prevalence of the infection among the wounded soldiers in Europe. The most extensive recent researches seem to have been published by Taylor, pathologist under the Robert Walton Goelet Research Fund (Hospital Complementaire, Ris-Orangis, S. & O.). He has written three exhaustive and exceedingly interesting articles. In the transactions of the American Surgical Association(19) he says in part: "We believe that the gas bacillus can be considered in its usual form as a pure saprophyte, and that the occurrence of gas gangrene should be regarded as the result of the mechanical accident of gaseous distention. We believe that, like tetanus, it is a preventable disease. The bacillus resembles that of tetanus in its frequent occurrence in cultivated soil, its need for anaërobic conditions which determine its saprophytic nature, and its need for a local focus of necrotic tissue in order to become a danger to its host. It differs from the tetanus bacilli in that with the latter the toxin is the active factor while with the gas bacillus the mechanical action of the gas is the chief thing to be considered. As in the case of tetanus, all fresh wounds should be considered as potentially malignant, and all available prophylactic measures should be applied routinely. We would suggest the routine use of quinine dressings (1 per cent. quinine hydrochloride solution) as perhaps more nearly specific than any other antiseptic. Its use is especially indicated during the first few days after injury."

In *The Lancet*(20) the factors discussed by him are: (1) The endo-toxin contained in the bacillus; (2) the exotoxin elaborated by the bacillus; (3) the toxin elaborated from the tissue undergoing, or which has undergone, degenerative changes due to the action of the bacillus, which substance, for lack of a better term, has been designated "tissue toxin;" and (4) the gas produced by the growing bacilli. From his experience and from his study of the pathology of the clinical cases he formed the following conclusions:

"(1) The gas produced by the bacillus aerogenes capsulatus is of little or no importance as a toxic factor.

"(2) The mechanical action of the pressure produced is usually, if not always, the most important part of the infection. To it may be charged the development of highly pathogenic possibilities in a usually rather innocent infection. It brings about (*a*) the death of the tissues from the resulting anemia produced by a pressure much higher than that of the circulating blood; (*b*) the actual mechanical fragmentation of the tissues, especially muscle; and (*c*) the mechanical scattering of the infection.

"(3) One of the chief problems in the treatment of the infection is that of establishing drainage for the escape of the gas before the pressure has resulted in the death of the tissue."

In the *British Journal of Pathology and Bacteriology*, Taylor(21) reports his studies of fifteen autopsies of clinical gas gangrene, in which this infection was evidently the cause of death, and eleven biopsies (eight arms and three legs). Seven of the fifteen cases coming to autopsy gave a pure culture of the B. aerogenes capsulatus from the heart blood; in one other case the same bacillus was associated with streptococcus. Blood cultures taken shortly before the death of these patients were sterile in every case. The other six autopsies gave positive cultures of the bacillus from the wounds or subcutaneous tissues. In nine cases the autopsies were performed within five hours of death, and in four cases within one hour, three of the latter showing the bacillus at that time in the heart blood. In only one case was the bacillus obtained from the blood of a living patient, although many cultures have been taken within an hour of death. The one exception was in a case of gas gangrene of the thigh, which ultimately recovered. In this case the bacillus was obtained twice in culture from blood taken from the arm vein shortly after an operation for drainage of the thigh; it was probably a postoperative and temporary invasion of the blood by way of the vessels cut in the treatment of the thigh, and the blood proved sterile forty-eight hours later. Invasion of the blood by this organism during life is apparently rare, although the fact that one case of gangrene of the shoulder developed a metastasis in the buttock before death tends to show that such invasion may occur. In two cases the bacilli have been found at autopsy in the liver and spleen—probably the result of a terminal invasion. In the guinea-pig, however, judging from the changes in the internal organs on autopsy immediately after death, antemortem septicemia seems to be usual.

In thirty-four autopsied guinea-pigs and rabbits experimentally inoculated with the strains from the preceding cases cultures from the heart's blood of the animals gave positive growth of the bacillus aerogenes capsulatus twenty-five times. In the other nine cases it was obtained from the peritoneum.

In 216 wounds examined bacteriologically 130 or 61 per cent. showed a gas producing organism morphologically resembling gas bacillus. Of these 130 cases 35 per cent. showed clinical symptoms of gaseous infection. Most of these cases were examined a week or more after injury, but even in the fresh cases the incidence of the gas bacillus reached as high as 75 per cent. This authoritative paper of Taylor's should be read by any one interested in this subject, but it may be stated here as the latest information that he suggests that the fatal cases pass through the following phases:

Phase 1. *Dormant Stage.*—Localized infection of the wound. Gas bubbles may be present and smears and cultures show the presence of the B. aerogenes capsulatus.

Phase 2. *Stage of Acute Gaseous Distention.*—The result of obstruction to the escape of the gas generated locally in the wound. This obstruction appears to be the factor determining the development of a malignant from a comparatively innocent infection. During this stage are seen the swelling, subcutaneous edema and discoloration of the skin. The death of the affected muscles results from the anemia due to the intramuscular pressure of the gas and from the exotoxin of the bacillus. Permanent vascular obstruction, such as thrombosis, may also occur at this stage. The focus of gas formation and other bacterial activity may still be limited to the region of the wound.

Phase 3. *Explosive Stage.*—This is characterized by the rapid extension of the swelling associated with subcutaneous crepitus, and is probably the result of the rupture of the muscle sheath and the escape of the gas contained within it into the loose and usually edematous subcutaneous tissue. The rapid expansion of the gas probably aids in the dissemination of the bacteria.

Phase 4. *Stage of Systemic Intoxication.*—This is probably due to the absorption of the highly toxic by-products of the autolysis of the muscle killed during Phases 2 and 3, augmented by the absorption of the exotoxin produced by the bacilli.

Phase 5. *Stage of Septicemia.*—The terminal invasion of the blood by the bacilli, when it happens, is probably a very late phenomenon occurring approximately at the time of death.

The first phase, or the stage of local infection in the wound with the free escape of a small amount of gas, represents a common type seen in the fresh wounds. The great majority of cases do not pass beyond this stage. When, however, for any reason, the free escape of the gas becomes interfered with, the second phase, with its clinical picture of gas gangrene, develops rapidly and passes frequently within a few hours into the third stage. If sufficient drainage be established at this point for the escape of the gas and too large a mass of muscle has not been destroyed, recovery is usual; otherwise the patient passes shortly into the stage of intoxication and dies within a few hours—frequently before the fifth or septicemic stage is reached. The possibility of gas embolism cannot be excluded in all cases, but seems improbable as a cause of death.

Wallace(22) supports Taylor's statement that gas gangrene is primarily and mainly a disease of muscle.

McNee & Dunn(23) say "A point worth notice is that death may occur quickly, following a comparatively slight wound, when examination postmortem shows gas gangrene involving only a small bulk of actual muscle tissue. The material elaborated by the bacilli, therefore, whether it be a true toxin or not, is at any rate a powerful systemic poison. Sir Anthony Bowlby has pointed out to us that cases of this kind may very readily be mistaken for death from shock alone." They also state that bacillus aerogenes capsulatus

(B. perfringens) is the commonest and most abundant organism found in gas gangrene. "It appears often to be the only organism which is isolated from the spreading margin of the gangrene at a distance from the wound. The biology of this organism, with its powerful fermentative action on sugars and resulting evolution of gas, fits in very well with the extraordinary rapidity of spread of acute gas gangrene." In their study of microscopic lesions they found spaces left between degenerated fibers and the mesh work of interstitial tissue, this in the average in the edge of the gangrene where isolated degenerated fibers were scattered among normal fibers. They are of the opinion "that a toxic fluid, perhaps similar in constitution to the edema which always accompanies gas gangrene to a greater or less extent, spreads along between the interstitial tissue and the fibers, killing off the latter as it advances. Once the fibers are killed, the anaerobic bacilli live on them practically as saprophytes, breaking down the sugars and producing abundant gas."

Frankau, Drummond and Neligan(24), as a result of their study of treatment of gas gangrene, have an interesting article on resection of muscle and the after-treatment of the case.

Radiographic Diagnosis and Serum Therapy.—During the last year several papers have appeared, particularly in the British and French publications, on the use of the *x*-ray in the diagnosis of gas in tissues. Morgan and Vilvandre(25) discovered such diagnostic possibilities for gas in the course of routine examinations with *x*-ray for pieces of metal or fractures. They emphasize two points which appear to them to be of the utmost importance regarding the diagnosis of gas in the tissues by the *x*-ray.

1. It supplies a means of making an earlier and more definite diagnosis than can be made by any other method.
2. In cases where an amputation is under consideration, the rays will give information as to the extent of the tissues involved, and, by so doing, may obviate a further operation later on which might otherwise be necessary, owing to the fact that the first operation did not include all the infected tissue.

Black(26) reports radiography of nine cases in which, when sent for *x*-ray examination, there was in most instances no suspicion that any gas was present and in none of which was gas clinically certain. In each one the *x*-ray demonstrated the presence of the gas which was afterward confirmed bacteriologically. The patients presented no unusual features, all had a moderate pyrexia and all complained of pain. Tenderness was present on pressure over the affected areas, but no crepitation could be felt. In one case the latent period between the date of injury and the detection of gas was almost five weeks. After operation a speedy recovery was the rule.

Bull and Pritchett(27) have just published an important report in which they state that they have succeeded in demonstrating a toxin in bouillon cultures of gas bacillus passed through a Berkefeld filter and that with this toxic filtrate they have stimulated active immunity in pigeons and rabbits and have found the blood taken from the immunized rabbits capable of neutralizing the toxic filtrate *in vivo* and *in vitro.* They observe that the toxin seems to possess the properties of an exotoxin. They have designated the filtrate as toxin and the immune serum as antitoxin. The antitoxin is protective and curative against infection with the spore and the vegetative stages of bacillus Welchii in pigeons. The limits of the protective and curative action are now under investigation.

CONCLUSIONS.

1. The utmost precaution should be taken in surgical obstetrics to prevent infection; otherwise conditions following a difficult labor are peculiarly favorable to gas bacillus infection.
2. The aids of blood culture and blood count should always be used to help establish a diagnosis when septicemia is a possibility. Radiography can be used to advantage for diagnostic purposes in early suspected cases.
3. The old prevailing opinion that gas bacillus infection is fatal is erroneous. The prognosis is improved in direct proportion to the early diagnosis and prompt application of modern treatment.
4. There is proof that bacillus aerogenes capsulatus circulates in the blood of the host before death; also that it produces gas before death, chiefly in muscle, but probably only in tissues which have been previously injured.
5. Whether toxemia or mechanical injury is the greater factor in producing the injury seems still open to discussion. It is probable, at any rate, that the bacilli produce a powerful exotoxin which can stimulate active immunity and the day may be soon at hand when gas bacillus antitoxin will be used effectively as a routine measure as well as tetanus antitoxin and typhoid and paratyphoid vaccine.

Gross and microscopical specimens from the case reported, bacteriological cultures and the animal used for identifying the organism positively are here for inspection.

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101 W. CHESTNUT STREET.

THE CERVICOPLASTIC TREATMENT OF STERILITY.*

BY

ARNOLD STURMDORF, M. D., F. A. C. S.,

Clinical Professor of Gynecology, N. Y. Polyclinic School and Hospital, etc.,
New York City.

In its clinical designation, the term sterility is purely relative, necessarily implying in a given case, the presence of approximately normal anatomic and physiologic essentials to conception, without the consummation of offspring. Physiologically, every woman who menstruates, ovulates. Biologically, ovulation predicates potential fecundity. The virgin ovary harbors from forty to sixty thousand ova. Ovulation, fertilization and nidation constitute the chronological cycle of conception and any perversion in their normal concurrence determines sterility. We cannot create a function, we can only attempt to activate one existing in dormant state, stimulate one deficient, or possibly mobilize one tentatively inhibited. The maturation of a Graafian follicle and liberation of its contained ovum, the evolution of the corpus luteum, the endometrial transmutation essential to deciduation, the subtle biotactic elements that dominate ovular fertilization and nidation are all susceptible to inhibiting influences, temporary or permanent, local or systemic, most of which involve problems far beyond our present diagnostic horizon and therapeutic scope.

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Who can explain, why the conjugation of a perfectly normal female, with an equally normal male proves sterile, while the subsequent union of each with another, demonstrates the fecundity of both? To apply the serological hypothesis of "a selective ovular immunity to certain strains of sperma"—in explanation, is mere terminological juggling. Fecundity is a question of seed and soil, we cannot control the seed, we can only enhance its viability by correcting a deficient soil; we cannot control the ovule, we can only aim to correct certain endometrial abnormalities inimical to its fertilization and nidation.

The endometrium must provide a medium, conducive to the virility and progression of the spermatozoon in its fertilizing mission, and must respond normally to ovular fertilization with a concurrent activation of its decidual potentialities essential to normal nidation.

This functional complex, reveals the endometrium as a highly specialized tissue, to be assiduously conserved and not to be harrowed and scraped with impunity. It presents the clinical dominant in sterility of cervical origin and establishes the rational limits of our present therapeutic range.

Functionally as well as structurally, a sharp line of demarcation differentiates the corporeal endometrium from the cervical mucosa, but the one feature of greatest practical significance, is the remarkable disparity in pathological manifestations displayed above and below the internal os. According to established modern conceptions, chronic corporeal endometritis is extremely rare, our former acceptance of the condition was based upon misinterpretations of the normal endometrial changes characteristic of its menstrual cycle.

This relative immunity of the corporeal endometrium stands in striking contrast to the extreme susceptibility of the cervical mucosa to infectious invasion, *but for this relative immunity of the corporeal endometrium*, the extreme prevalence of chronic endocervicitis, would render the largest majority of women sterile, for *a diseased cervical mucosa is capable of immobilizing and destroying spermatozoa.*

The marked spermatocidal effect of a diseased cervical mucosa is vividly depicted by Reynolds, who, utilizing Hühner's postcoital method for the direct observation of spermatozoa aspirated from the cervical cavity, states:

"It is extremely interesting to see how actively mobile spermatozoa progress across the field of the microscope in a cervical secretion of grossly normal appearance, until they come in contact with some clump of pus cells, with which the tail of the spermatozoon becomes entangled. The result then is, that it indulges in futile struggles to escape, by the violence of which, it becomes exhausted and in a few minutes gives up the struggle and lies still."

But beyond the direct devitalization of sperma by the diseased cervical mucosa, other factors, of equal and greater potency in the causation of sterility, may be incited through the influence of cervical disease upon the functions of the uterus as a whole, for, *while chronic endocervicitis never extends to the corporeal endometrium by direct continuity*, a sterility accompanying the former *is due in large part to the functional derangements induced in the latter.*

Chronic endocervicitis with derangement of uterine functions presents the most familiar symptom complex in gynecology, nevertheless the nature and sequence of the pathologic phases, that link the one to the other, constitute a gap in our knowledge, which is further obscured by standardized misconceptions productive of the hit and miss empiricism that characterizes prevailing corrective methods.

The correlation of these pathological links finds ample elucidation in my previous publications on tracheloplastic methods, hence the most salient features only will be reëmphasized here.

The specific functions of the uterus necessitate the widest possible range in the control of its blood supply and like the heart it automatically controls its fluctuating circulatory demands by intermittent cyclic contractions, not only during gestation, but throughout its entire functional existence.

The cervical cavity serves as atrium or reservoir to the uterine cavity proper and while its amplitude, as a portal of ingress for spermatozoa, has dominated the mechanical and surgical treatment of sterility for ages, its efficiency as an excretory duct has not attracted consideration.

A cervix that offers sufficient egress for millions of blood cells during every menstruation, will readily afford ingress to a spermatozoon, whose diameter measures less than that of a single red corpuscle; moreover we constantly encounter fecundity in cases of so-called pin-hole os and sterility in widely gaping lacerated cervices.

The cervix is lined with racemose glands, whose secretions must find outlet in the normal and more especially in an abnormal state; under normal conditions, this drainage is effected, not *merely* by a simple outflow, through a passive os, but by the active rhythmic expression resulting from uterine contractions.

To comprehend this mechanism and realize the full significance of endocervical disease upon uterine function, we must discard our present conceptions of the myometrial arrangement and the fallacy of a cervical sphincter.

The architectural design of the cervical musculature precludes any concentric closure of its outlet, which dilates with every uterine contraction, because its muscle fibers, which are directly continuous with those of the corpus uteri, do not at any point completely encircle the cervix, but are disposed in serried successions of oblique circle segments, which, by contracting spirally upward, necessarily shorten every diameter of the uterus and by their uncoiling in the cervix widen the os like an iris diaphragm in a microscope.

Cervical dilatation thus becomes an integral part of uterine contraction instead of a passive dilatation in a hypothetical sphincter and incidentally explains the apparent obliteration of the cervix during parturition.

In the cervix, as elsewhere, every infection incites the greatest reaction in the lymphatic elements.

The cervical lymphatics may be traced from their lacunar origin in the cervical canal, through minute funnel-shaped ostia, *directly to the muscular coat*, where they expand into an extensive capillary net, which enmeshes every fascicle and bundle of the uterine musculature to the peritoneal surface, whence they drain into their main collecting channels at the base and top of the broad ligament (Leopold).

Thus the normal course of the lymphatics conveys an infection from the cervix—*not to the corporeal endometrium*—but along the intramuscular planes of the uterus, where it impairs uterine contractions by infiltrating the muscle sheaths resulting in nutritional deficiency; progressing to the periadnexal network, it inhibits tubal peristalsis and agglutinates the fimbrial ostia by adhesions, finally reaching the ovaries, it impedes the normal rupture of Graafian follicles by thickening of the ovarian tunica albuginea, thus completing the chain of pathological events that link cervical disease and sterility.

Crystallized into a concrete postulate, chronic endocervicitis presents the key to the therapeutic problem in sterility of cervical origin, and the success of any curative attempt upon the cervix will be proportionate to its elimination of an existing endocervical infection.

The question as an abstract proposition, whether a tracheloplastic widening of the cervical canal cures sterility by facilitating the ingress of spermatozoa or the egress of deleterious secretions, would appear of more academic than practical interest, but applied to the individual case it acquires the significance that distinguishes between rational procedures and empirical practice.

Every curative attempt should be based upon a correct perception of indications and a definite realization of its aim and scope. We must know why we operate, in order to determine when and how to operate.

In general and special gynecological practice, dilatation and curettage still hold sway as the panacea for sterility, and while discriminate dilatation may prove of benefit in some very mild infections by establishing temporary drainage, curettage cannot be too emphatically condemned in any case.

The curet cannot reach the deeply situated racemose tufts of the muciparous glands in the cervical lining and it should not injure the utricular tubules of the corporeal endometrium, which are rarely if ever involved in the disease and whose specific functions in menstruation and gestation may be permanently vitiated by the lacerations and inoculations incidental to this time-honored traumatism.

Boldt states: "Next to curetting, dilatation of the cervical canal, principally to overcome sterility, is the operation most frequently done without proper indication. Those who have made observations will probably concede, that in 75 per cent. of patients so treated, the intervention is unwarranted."

The cervicoplastic operations in vogue for the cure of sterility comprise the so-called discission and amputation, that is—the cervix is either split or ablated.

Many women undoubtedly conceive after one or other of these operations, as they occasionally do after dilatation and curettage, but to attribute an eventual fecundity to the curative effect of this or that procedure, is an obvious "*post hoc*" interpretation, for it must be conceded that, on the one hand, many women presenting operative indications, ultimately conceive without any intervention whatsoever, while on the other hand, a very considerable number of operations prove utterly futile of results.

Chronic endocervicitis involves the entire cervical mucosa from external to internal os and it follows that a partial ablation of the cervix can result only in a partial elimination of the diseased area while a high amputation for sterility is an unwarranted mutilation that defeats its ultimate object.

One hundred and twenty-eight complete postoperative histories from among four hundred recorded cases tabulated by Leonard in Howard Kelly's clinic, revealed 80 per cent. of sterility after low amputation for cervical lacerations.

In other words, eight out of ten women, of established fecundity, are sterilized by prevailing methods of cervix amputation and while we recognize an occasional postpuerperal sterility as a possible sequel of birth injuries its occurrence never attains to such proportions.

Just as long as endocervical disease persists, so long will its resulting sterility persist.

The normal cervical lining is not essential to conception or gestation, but a diseased lining is inimical to both.

All cases of chronic endocervicitis, characterized by erosions and mucopurulent secretions, are incurable by any means short of complete enucleation of the entire endocervical mucosa from external to internal os and the relining of the denuded canal by a cylindrical flap from the vaginal sheath of the cervix.

The preceding pathological indications and technical demands are fulfilled by the following procedure, which is essentially identical with that submitted by me for the tracheloplastic cure of infected cervical lacerations.

The main steps in the operation consist of:

1. Outlining and free liberation of an ample cuff from the vaginal sheath of the cervix.
2. Enucleation of the entire endocervical mucosa from its surrounding muscular bed, up to the internal os.
3. Sutural inversion of the vaginal cuff into the denuded cervical cavity.

To secure an ample cuff of vaginal mucosa, an outlining incision is made to encircle the eroded area around the external os.

The edge of the flap thus outlined is freely liberated as a cylindrical sheath completely around the entire cervix to the level of the internal os.

The eroded external os and the entire cervical lining, are now cored out of the surrounding muscular layer to the internal os, as a complete cone.

In a congenitally deformed cervix, its muscular framework thus exposed, may now be advantageously reshaped by appropriate incisions on the lines established by Sims, Pozzi, or Dudley, according to indications or predilection.

The tubular flap of vaginal mucosa is not included in any of these corrective incisions to which no individual stitches are applied, as the two main retentive sutures secure all necessary coaptations.

These retentive sutures are introduced as follows:

Beginning at the anterior edge of the cylindrical flap, a long heavy strand of silkworm gut is introduced on its vaginal surface, transversely through its center, like the first loop of a mattress suture, one-eighth of an inch from the free border and embracing one-eighth of an inch of tissue, this suture hangs free until a second suture is passed through the posterior edge of the flap in a correspondingly similar manner.

The right free end of the anterior suture, threaded in a specially bent Peaseley needle, is now carried into the cervical cavity to a level just above the internal os, whence piercing the cervical musculature in a direction forward, upward and slightly to the right, emerges on the vaginal surface at the base of the flap.

The left free suture end is directed in the same manner forward, upward and to the left, so that the two suture ends diverging slightly in their course, reappear in the center of the anterior vaginal fornix, about one quarter of an inch apart.

The free ends of the posterior suture are passed in a corresponding posterior direction and emerge in the center of the posterior vaginal fornix.

By tightening and tying each individual set of suture ends, the tubular vaginal flap is drawn into the denuded cervical cavity, thus relining its entire raw surface, at the same time it is automatically interposed between the edges of any supplemental incision or excision of the cervical musculature, preventing their reunion and is approximated to the circumference of the internal os, where it is firmly retained in close apposition until the sutures are removed.

Drawing too short a vaginal flap into the cervical cavity will foreshorten the anterior vaginal wall and tilt the uterus backward.

To lengthen a congenitally foreshortened anterior vaginal wall, as suggested by Reynolds, it is only necessary to incise the anterior flap segment transversely and pull this transverse incision into a longitudinal slit before passing the main sutures which emerging at the sides of the slit, coapt and retain its edges in the longitudinal axis.

Additional sutures are usually unnecessary, the silkworm ends are left long to facilitate their removal and tucked into the vagina.

A narrow strip of iodoform gauze introduced into the cervix with the object of maintaining flat coaptation of all raw surfaces completes the operation.

This gauze is removed on the third or fourth day, when the patient is permitted to walk about.

The stitches are not removed until the end of the third week.

I would not dogmatically attribute the cure of sterility to this operation any more than to other procedures, for there is too much that is unknown and unknowable involved in the problem, but I may assert, after a very extensive and critical trial, that the method as outlined, radically eliminates chronic endocervicitis, the one established causative factor in the sterility of cervical origin.

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51 WEST SEVENTY-FOURTH STREET.

RETAINED PLACENTA.

BY

E. P. BARNARD, M. D.,

Philadelphia, Pa.

THE third stage of labor is not infrequently treated with scant obstetrical skill. The baby has been delivered, the doctor is tired, his other work has been neglected, and the temptation to hurry along this seemingly unimportant part of the delivery is strong.

Normally the placenta is squeezed or pinched off of the uterine wall by the contractions of the uterus and the formation of a retroplacental clot. Even though this separation has been complete the placenta may still remain in the uterine cavity constituting what is termed a retained placenta. The cause of this retention may be inefficient uterine contractions or a tetanic spasm at the contraction ring, following the administration of ergot or pituitrin. Even though the placenta is free in the uterine cavity, too vigorous effort to express it is likely to dislodge the clots forming in the uterine sinuses and sharp hemorrhage may be the result. The detached placenta requires no radical procedure for its delivery, only patience unless hemorrhage makes haste necessary.

If bleeding is present, in the absence of uterine relaxation or partial inversion of the uterus due to too violent Credé or traction on the cord, it is rather strong evidence that some portion of the placenta is still attached and it may be necessary to resort to more active manipulations of the uterus to facilitate its complete separation.

Ahlfeld says that not more than 14 per cent. of women will deliver the placenta spontaneously within two hours. I should feel that a half to three-quarters of an hour would be ample time to allow a placenta to separate and deliver itself, if not I would aid by gentle Credé.

One great criticism of the management of the third stage of labor is the too early using of the Credé and frequently the too forcible use of this method to deliver an unseparated placenta.

It is usually not difficult to determine when the placenta has separated and is free in the uterine cavity. The contracted uterus immediately after delivery is in a position just above the symphysis

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pubes. Place a hemostat on the cord near the outlet and as the uterus rises in the abdomen the hemostat will remain stationary if separation has taken place; if the cord is drawn taut and the fundus manipulated a wave-like vibration is transmitted through the cord indicating that the placenta is still attached.

Frequently the placenta is in the grip of a very strong contraction at the contraction ring; until this spastic condition passes off there is little use trying to deliver it. Cease all uterine manipulation allowing the contraction ring to relax, then gently Credé and slight traction upon the cord will usually accomplish the desired result.

It should never be necessary to introduce the hand into the uterine cavity to deliver a retained placenta. DeLee states that more women die during the third stage of labor than in the other two combined. Postpartum hemorrhage and serious morbidity are very often the end result of a faulty conception of this important mechanism.

Maternal mortality has been greatly reduced since 1853 when Credé described his method of placental delivery.

John Harvie seems to have practised some such method at the Rotunda Hospital in Dublin as early as 1767, but priority is given to Credè who first brought it to public attention.

Credés maneuver was primarily to hasten or aid separation; it seems better to allow the normal contraction of the uterus to perform this duty.

Prior to Credé's time placentas that were difficult to deliver usually were delivered by the introduction of the hand into the uterine cavity which in the absence of present aseptic obstetrical technic added greatly to the possibility of infection, and increased mortality. Even at the present time there are too many diagnoses of adherent placenta, and the too impatient desire to interfere with the natural method of its delivery.

If after examining the placenta there are indications that a small portion of it is still attached, it is I think questionable whether any immediate intrauterine manipulation for its delivery should be done.

Such portions if not large or the cause of excessive bleeding can be dealt with in an expectant manner. If morbidity does follow with the knowledge that all the placenta or membrane were not discharged at the time of delivery one is influenced to make an earlier exploration of the uterus for their delivery.

A summary of the treatment of this rather simple condition would seem to consist of: First, determining whether the placenta had separated; Second, gentle manipulation of the uterus in order to promote contractions and subsequent separation; Third, to wait a reasonable time (fifteen or twenty minutes) after separation for the uterus to expel the placenta and if not accomplished in this time, the use of gentle Credé with light traction on the cord.

RETAINED ADHERENT PLACENTA.*

BY

CHAS. B. REYNOLDS, M. D.,
Philadelphia, Pa.

THE term retained or adherent placenta complicating the third stage of labor at or near full term may be defined as a partial or complete adherence of the placenta to the uterine wall due to the preponderance of connective cells resulting in atrophy or absence of the cellular or spongy layer of the decidua serotina. The chorionic villi dip down into and between the muscular fibers of the uterus, the blood-vessels are partially obliterated and separation prevented by the development of fibrous tissue in the intermuscular spaces.

Complete adhesion of the placenta is rare, the pathologic changes usually being limited to portions of the organ.

In the interne department of the Rotunda Hospital, for the year 1915, there were recorded twenty-eight cases of adherent placentæ in 2070 deliveries. B. C. Hirst reports it about once in 1000 cases; Polak has seen one in 2000 cases. In the Maternity Department of the Medico-Chirurgical Hospital, we had three in the last 1000 deliveries.

Observers differ as to the cause of adhesions of the placenta, since it occurs usually in multipara, a low grade of endometritis has been assigned as a cause, due possibly to a mild infection following abortion or during the puerperium of a former labor with imperfect regeneration of the mucous membrane. Gonorrhea and syphilis also have been assigned as causes. Boyd and Wilson(1) report the case of complete placenta previa in a multipara aged fourty-one, admitted to the Lying-In Charity during the ninth month of gestation. She was bleeding profusely from the vagina, the cervix was partially dilated and the canal contained an overgrowth of decidual tissue. In extracting the placenta the overgrown portion was found densely adherent to the wall of the cervical canal and the external os. In making the detachment at this point shreds of decidua were left on account of the difficulty experienced in the removal.

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Brodhead(2) reported a case of rupture of the uterus in the neighborhood of a Cesarean cicatrix in a succeeding pregnancy due to the invasion of the musculature even to the serosa by decidual tissue. The diagnosis is made during the third stage of labor which is usually prolonged, the normal contractions and retractions are interfered with, firm pressure and gentle manipulation over the fundus fail to accomplish the separation, and gentle traction on the cord transmits an impulse to the external hand over the fundus. In the partially detached variety the hemorrhage may be alarming, if the detachment be extensive, and the uterus fail to contract firmly and close the gaping sinuses. In a completely adherent placenta there is no bleeding from the placental site, a condition which obtains in a completely separated placenta retained in the upper segment of the uterus by the contraction at Bandl's ring; or a retained placenta lying loosely in the lower uterine segment. In the treatment of a partially adherent placenta one's efforts should be directed toward the prevention and control of hemorrhage. Pressure over the fundus of the uterus augmented by careful manipulation at the height of a uterine contraction, if persisted in may accomplish the desired result. In two of our cases the placentæ were expressed by compression over the fundus uteri after three hours of patient effort.

In the presence of severe hemorrhage, the gloved hand, under the strictest aseptic precautions should be inserted into the uterus, the detached portion sought and the placenta detached bimanually; the hand enclosing the placenta is held in the uterus until it contracts firmly; if a clean detachment has been made there is little danger from secondary hemorrhage. In complete adhesion of the placenta, the Credè method should be persisted in until signs of separation appear. If hemorrhage be alarming the patient should be anesthetized and the separation begun at the point of detachment so as to make it. Great care should be exercised in making the detachment as the uterine wall at the placental site is easily lacerated, and serious bleeding ensue. The external hand, however, should act as an efficient guide.

Our third case of partial detachment of the placenta occurred in a Polish woman, aged twenty-three, multipara, admitted to the hospital in emergency, suffering from the effects of severe hemorrhage from the vagina; pulse 126, temperature 101, hemoglobin 30 per cent., and the general appearance of having lost a great amount of blood. She gave the history of having been delivered by a midwife eighteen days before. During the ten days of the puerperium while in bed the vaginal discharge was apparently normal. On resuming her household duties she bled from the vagina at frequent intervals and complained of frequent attacks of pain in the womb. Under ether anesthesia the uterus was explored manually and a partially adherent placenta removed. The attached portion was firm in texture, while the detached part was dark red and very soft; the cord had torn off near the placental attachment. She remained in bed six weeks, the temperature varying between 99 and 102. At no time were we able to elicit any pain or outline a mass in the pelvis. She left the hospital in good condition, the uterus slightly enlarged, and freely movable. We believe the fever in this case was due to an infection which gained entrance to the system through the placental site.

Wallace(3) reported a case of retained adherent placenta in a patient attended by him during her labor which came on at the eighth month. While waiting for the placenta to be delivered he was called away and left a midwife in charge. He did not see her again for two months when he was called and found her suffering great pain, the uterus was the size of a child's head, and there was some vaginal hemorrhage. The placenta which resembled a fibrous mass, quite fresh and without fetor, was expelled by compression over the fundus uteri. The midwife had remained one hour, concluded the placenta had been expelled, and applied a bandage. The dangers are: *Hemorrhage* in the partially detached variety. *Inversion of the uterus* due to vigorous manipulation over the fundus and forcible traction on the cord. *Sepsis* is usually due to bacteria carried from without into the uterus by the hand or instruments and lodged in the placental site during the process of detachment. It is claimed that manual removal of adherent placenta is the cause of death from sepsis in 10 per cent. of patients.

We believe that the morbidity and mortality from sepsis can be considerably lowered by a careful preparation for labor, rigid cleanliness and infrequent examinations during its progress.

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THE SURGEON'S RESPONSIBILITY TO THE ECONOMICS OF THE HOSPITAL.

BY

EMERY MARVEL, M. D., F. A. C. S.,

Atlantic City, N. J.

"HOSPITALS are managed with laxity, exhibiting extravagance, waste, and general economic inefficiency," is the verdict rendered by an eminent efficiency expert after he had made a survey and study of a large number of institutions. Regretable as is this declaration, I am convinced that it truthfully portrays a common condition, and venture now to call attention to it, prompted by a hope that in so doing an effort may be made to, at least, partly correct the evil. Why inefficiency to such marked degree should be tolerated in a hospital, when, if it existed in a bank or a similar institution, it would bring forth a vigorous protest from those interested, may have an explanation, but certainly has no justification. It might be explained by the fact that there are in hospitals no stockholders expecting pecuniary gain; or that the hospital directors are not held liable for the economic loss; or, as the dominating factors contribute their services gratuitously they are not so exacting in their acts; or that the managerial agents, being multiple and showing divisional directions, there is no one person upon whom the responsibility is centered. If these reasons should explain the existence of this undesirable condition, they yield no justification for it; and the further endurance of the customs producing the condition should be terminated.

MUTUAL DEPENDENCE EXISTS BETWEEN HOSPITAL AND SURGEON.

The hospital is an institution for social service; the beneficence of this service is dependable upon the surgeon. There exists a mutual dependence between the surgeon and the hospital; and, likewise, the greater service of the one is proportionate to the higher quality of the other. Reference to the surgeon here is meant to include also the physician. How the hospital may be regarded in the community is greatly due to the character of the surgeon; the quality of the hospital reflects the surgeon's efforts and his value.

Much, if not the greater part, of the responsibility for the success of the hospital, and, likewise, for a large proportion of the dissipation of its resources, rests upon the surgeon. The institution is constructed and maintained for the care of the sick; the direction for administering the needs comes from the surgeon. Laymen may form the governing board having to do with the financial administration; their work is to provide the means by which the needs, as prescribed by the surgeon, shall be applied. The surgeon is, therefore, the fundamental power. I am mindful of those familiar complaints, too often listened to from the staff member, that the medical staff has no voice or power in the direction of the hospital. How much these complaints evidence the enfeeblement of the complainer is obvious. The more we study this condition, the more convincing is it that the managing board is receptive to, in fact seek, the counsel of the progressive surgeon. When complaints to the contrary are expressed, it is evidence that the lights of the complainer have either been hidden under a bushel, or more often the lights are too dim to be seen. The surgeon who takes a justifiable initiative is well repaid for his effort, when his initiative is based upon the sound foundation of knowledge and not upon the flimsy soap-box of impression.

THE SURGEON SHOULD BE FAMILIAR WITH THE COSTS OF ARTICLES WHICH THE HOSPITAL PROVIDES.

He who carries the hod and the brick from which he moulds the walls of his own house, is best able to direct others in like operation. I have often thought if every surgeon had an apprenticeship in managing a hospital, every expense of which he were obliged to pay himself, how much differently he would handle the assets of that institution which he is supposed to serve. I am constantly impressed with the small percentage of our men who show evidence of any familiarity with the cost of articles which they prescribe; and further, even to recognize in some a disdain for the thought that they should give consideration to the matter of expense. With a realization that the first and paramount duty of the surgeon is to conserve the comfort, protect the life, and minimize the morbidity of his patient, I realize that his duty is but little less to conserve the economic use of the hospital's resources, when such may be accomplished consistent with his best service to the patient.

PUNCTUALITY AND REGULARITY SHOULD BE OBSERVED.

Discipline is essential to secure the best services from the nurses and internes. Systematic schedules are defined for their observation and guidance; yet many surgeons have seemingly no regard for punctuality as regards appointments at operations, or regularity for his visits, and the time for surgical dressings. The waste of time of the nurses, internes, orderlies and other helpers occasioned by the surgeon who is late at an operation, fails to secure his proper consideration. A half hour's delay means a loss, for the combined forces waiting, of a half day's individual service, for which the hospital pays. But that is not all it means. Such a delay has upset the workings of the institution by disturbing the day's subsequent schedule; and necessitates additional loss of time in gaining a readjustment. It further brings confusion into the service which holds in its trail still greater loss. With rare exceptions, the surgeon may methodize his visits that require the helping services of the nurses and internes; and certainly can arrange to be punctual at operations. It is well that he should not take from the hospital these hours of service. It is not only a waste, a useless dissipation of the resources, it is the taking of that which belongs to another—is it honest?

HARMONY AND ENTHUSIASM SHOULD BE PROMOTED.

It is my belief that those performing the interne service ordinarily have a desire to serve well the purposes of the institution. That there are individual exceptions among nurses, and internes, as well as among servants, there is no doubt; and yet the adverse influence of these bad actors is increased or lessened in proportion to the general harmony and good spirit prevailing. It is within the power of the surgeon to promote and maintain such a spirit. It is his privilege, and likewise a duty, to stimulate enthusiasm for work among the nurses and internes. Discreetly discrediting the improper doings and the praising of meritorious work lies within his province, and when exercised goes far to help the general good. By the general influence which he exerts upon those under his direction he becomes an economic asset or a liability to the institution.

UNNECESSARY OR UNDULY EXPENSIVE REMEDIES ARE UNWARRANTED.

Waste of supplies, and the extravagant use of unnecessary or unduly expensive articles deserve to be deplored. To use piperazin at a cost of twelve dollars per ounce, when a salicylate costing fifty cents yields a more potent remedy, may be tolerated in private practice when impressions are being registered through the pocketbook; but it is little less than a crime when imposed upon the unconscious hospital exchequer.

The use of alleged dressing-powders costing fabulous prices, or the application of precious-metal foil to cover sutured sterile wounds, when the wound would heal equally as promptly and just as effectually by the simple dressing of sterile gauze, is indeed an extravagance. The extravagance of useless surgical instruments and equipments is eloquently testified to in the storeroom of every hospital. Such items as unnecessarily increased laundry cost are exhibited in most operating room work, as well as the waste of suture material. Unduly liberal, and unnecessarily frequent dressings of wounds exhibit wasteful extravagance; if not meddlesome surgery. Ether becomes an item commanding consideration. The prescribing of a certain Chemical Company's product seems to have become a habit with many surgeons, a habit engrafted not unlike a fetich. At one time this product possibly deserved the preference given it. Whether it has maintained its merit or not need not be discussed here. Suffice it to state, other products possess equal merit, and one other in particular has gained favor of preference by those who have studied the subject well. This latter ether is preferred by such institutions as the U. P. I. of Baltimore and the New York Hospital. It obligates the hospital but little over half what the first mentioned brand costs; and requires less quantity for the same service. Yet a large proportion of the surgeons continue to prescribe the brand first referred to. These items cited are not all; in fact, they are but few, to illustrate the responsibility of the surgeon in his prescribing economic extravagance and waste of the hospital's resources.

EFFECTUAL INSTRUCTIONS OFFERS AN ECONOMIC SAVING.

In the community service of the hospital repetitions of the same care are frequently rendered the individual patient, or the subsequent treatment for a like disease or injury is given members of the individual's family. The necessity for the hospital giving this subsequent care, with its consequent expense, could have been avoided, and this expense saved had intelligent action been exercised. These services are imposed upon the institution ofttimes on account of the ignorance of the afflicted, not knowing how to avoid the disease or the injury. The infected finger patient, who through ignorant procrastination suffers the loss of his finger and endures a morbidity which imposes his care upon the hospital for two or more weeks, should not, and will not, impose a repeated expense upon the hospital for like care when again he becomes a victim of another similar infection, provided he should have been taught the meaning of the simple infection and its significance should early treatment be neglected. Such instruction having been received by him, he is most likely to become a valuable emissary to his family, and also to his acquaintances, in enlightening them for their protection, thereby lessening the cost to the hospital for the potential care that might otherwise have been necessary. To protect the hospital against repeated obligations of this type it is obviously desirable that instructions for the afflicted be provided. Two classes of practical instructions may be provided for the hospital patient; that given by the surgeon at time of his visits; the other, that which should be provided for the convalescent hours. A direct statement from the surgeon as to the cause of the trouble and the means by which recurrence of similar trouble may be avoided, is capable of being driven home with force in this way and will effect valuable help not only to the individual, but through him also upon those with whom he subsequently comes into contact.

The convalescent hours, when the patients congregate for gossip, are alike dangerous to the patient and to the hospital. There is a seeming natural desire upon the part of the convalescent to talk operation and hospital experiences, and too frequently this talk takes the form of extravagance, if not imagination. Among some it is the particular desire to highly color personal experiences. The hour comes when there is a veritable contest between the patients in which one convalescent tries to outdo the other in reciting highly colored, alleged unhappy hospital experiences. The surgeon, the nurse, and the hospital, as well, are misrepresented, and ofttimes to the discredit of the hospital and its agents. In these hours of idleness, evil imagination is stimulated and fed. Seldom any good comes from these social conferences. Why not protect the patients and the hospital from them, and further, why not provide for utilizing this time in instruction that will lessen subsequent sickness and accidents among these people and through them influence those to whom these patients return when leaving the hospital. The opportunity for useful instruction is obvious. If the surgeon realizes this he may foster upon the hospital management the conviction of its usefulness and secure means for this special economic help.

UNDULY EXTENDED STAY OF PATIENTS IN THE HOSPITAL IS A DRAIN UPON ITS RESOURCES.

In order that a more thorough study of a patient be made to determine definitely the true nature of the illness, a stay in the hospital is ofttimes desirable. The procedure may prove an economy to the institution when the course is expedited, but when procrastination is practised the course becomes an unnecessary expense. The surgeon should have in mind that every day which a patient is cared for in a hospital there is a cost for the hospital to pay; it is desirable to expedite such study of a patient, and reach the conclusion without procrastination. A patient with suspected renal stone kept in the hospital for ten days for skiagraphic study when as satisfactory study could be determined in two days is adding an unjustifiable expense to the institution. Under the convenient pretext of "studying the case" ofttimes a patient waits impatiently and the hospital is submitted to the cost of the care, when in truth the indifference or the convenience of the surgeon's pleasure is being served. To conserve the economy of cost for hospital care the morbidity period should be studied. While the haste to operate, without clearly defined necessity, is to be deplored, to delay operation also carries obligations. To postpone an appendectomy for to-morrow when the removal of the appendix to-day favors a primary closure with two weeks morbidity or the few hours delay imposes four weeks morbidity, imposes a responsibility upon the procrastinator. Whatever else such delay has occasioned, it has added an increase of 100 per cent. cost to the hospital. The surgeon needs to prevent procrastinating study, delayed treatment and unnecessary extension of stay in order to serve the best economic interest of the hospital.

WASTE IN CONSTRUCTION AND EQUIPMENT.

In hospital construction, the members of the medical staff have their part. Insistence upon extra building for the accommodation of some special department when after provisions are made the service of the department is not availed of, is unwarranted.

In a recent survey of 42 general hospitals, 20 institutions had provided for a morgue equipped for autopsies. These institutions had experienced the usual quota of deaths, yet but six of these had an autopsy performed during the period of a year, and only fourteen autopsies had been performed in all of the hospitals.

In one institution a hydrotherapy department had been provided in response to solicitation from the medical staff, at a cost of approximately $20,000. At the time of my visit, when a hundred and fifty patients were in the house, together with a very large dispensing service, there had been five hydrotherapy treatments during the period of a month.

The average cost of constructing and equipping the morgue is estimated at $7000 and of those constructed but little more than 3 per cent. had been used. It is not to discredit the good service an equipped morgue may yield that I refer to this observation; instead it is to emphasize the inconsistency of urging its needs and then not using it, and, too, to point out the wasteful dissipation of the moneys for its cost when not used when the opportunity offers. The influencing expenditures of moneys for purposes which do not yield a commensurate return in service, is an economic waste. The surgeon who influences the building of a morgue or the constructing of a department for hydrotherapy, or other department, which is not subsequently utilized, assumes the burden for the economic loss.

It has been my aim to point out some incidents that might illustrate the contention that the surgeon shares the responsibility for the hospital's lack of economic efficiency. It has been attempted in the hope that by so doing some correction of this part of the evil might be made.

It would seem that one's responsibility is not limited to his active conduct, but he must share responsibilities for not utilizing the benefits which opportunity offers. The surgeon has responsibility for not directing new customs that have proven efficient, or for omitting to act, when by acting a greater service would be rendered. It is contended that correctable economic errors are prevalent in hospital management. The fact that the service of the hospital depends much upon the surgeon's direction, imposes upon him a corresponding responsibility. For the loss occasioned with the interne service due to delays the surgeon is responsible, and, too, for the extravagance and waste resultant from injudicious use of unnecessary and unduly expensive remedies, for the cost of construction and equipping of superfluous or unused departments, and also for the omission to advance methods to protect against the care of unnecessary disease and injuries.

EDITORIALS

PRENATAL CARE—A NATIONAL QUESTION.

THE necessity for the conservation of human life has gradually and steadily forced itself upon the world's attention during recent decades and substantial progress has been made along various lines of activity with the hope of accomplishing the desired end. The advent of the great war in Europe seems to have generated a fresh impulse in the direction of a more general interest in the question, both among the medical profession and the laity. The developments of the war have been of such a character that mere political and military questions have not figured alone in a consideration of its effects and there are other adjustments that will follow the conflict that already are the subject of attention by thinking men and women. Thus we find that in France, as shown in the article by Dr. Theodore C. Merrill, which appears in this number, the attention of the Government and medical societies has been pointedly directed, among other things, to the gradually declining birth rate in that country and the imperative necessity for its regeneration. The situation is acknowledged to be a grave one from the fact that the rapidity of the decline is accelerating and this unfortunate condition prevails without exception among all classes of the population. How to remedy the same is a task surrounded with untold difficulties, but the French have attacked the problem with their usual industry and no attempt is made to hide the facts, deplorable as they may seem.

The conditions now existing in France are undoubtedly duplicated in other countries and various of our own writers have already called attention to the declining birth rate among certain classes of the population. It may be possible to lower substantially the infant mortality by further effort but no decrease in the number of infant deaths can offset the effects of the lessening supply. The latter is due to social, physiological, pathological and economic factors, among which, nonfecundity (usually voluntary), and improper prenatal care are important causes. The necessity for a greater interest in prenatal problems has developed numerous active endeavors among medical and lay organizations to meet the same, and there is nothing that will bring the matter closer to the attention of the public than the constant reiteration of its importance by such organizations.

In the present issue will be found a symposium on prenatal care held at the Section on Obstetrics and Gynecology of the New York Academy of Medicine in May last, and also a paper by Dr. Merrill of Washington, in which certain conditions now prevalent in France are plainly set forth. The facts therein stated should give us food for thought. As a nation we must realize that we are confronted, or shortly will be confronted, by the same problems as our French allies and it is only by the full and early realization of these facts that we can develop methods to prevent their duplication. The more or less unfortunate growth of popular propaganda tending to the indiscriminate dissemination of widespread knowledge of family limitation must be regarded as a stupid and incomprehensible error, not only for its immediate but on account of its late or secondary effect. Nature's laws cannot be violated with impunity and it has been well said that women not only have children because they are healthy, but are healthy because they have children. It would be inappropriate at this point to discuss further the questions that have been debated popularly so much recently under the general designation of "birth control." It is merely sufficient to refer to the deplorable effects associated with this indiscriminate propagandist measure. But it has become necessary, however, to dignify maternity, to place it on a high pedestal as the consummation of all the faculties for which men and women are created and this respect should attach to every pregnant woman, who must be regarded with sympathy and, in fact, adoration. Until this sentiment is fully recognized and developed, the prenatal period will not meet with the attention which it merits and demands. Fortunately we are waking up to this great need as shown in the papers read at meetings such as the one already referred to and which we hope may be duplicated elsewhere. On prenatal care of a proper sort depends the future of the State and we must come to a realization of the great truth that a woman who has borne children must remain in the best possible condition to care for the same. She must not be injured by the processes of parturition, or at least such injuries should be reduced in extent as much as possible, for we cannot hope to attain the millenium in which pregnancy, labor, and the puerperium shall be entirely free from certain dangers. The proper and adequate care of the pregnant woman and the acknowledgment that maternity is one of the prime factors in the continuance and prosperity of the State, are subjects that demand our undivided attention. They are topics to be discussed in a spirit of practical coöperation between all the forces of society and organized government that can lend their aid to the solution of this problem. In this connection attention may be again directed to the conclusions arrived at by the committee appointed for the purpose of studying the question of the decline in the national birth rate by the French Academy; namely, that abortions should be rigidly prevented, that Neo-Malthusianism should be combated, that the decline in the French birth rate is purely voluntary, that family restriction is due to the cost of the child, that public funds must be provided to help liquidate the expense of child-bearing and child-rearing, that the sum to be allowed for application for the purpose before and after birth should not be less than 1000 francs, that the families having few children should aid those having many, and that the principles of justice and equity require the action here recommended. A resolution referring to the use of public funds for this purpose was recognized as necessary for early adoption and the plan finally selected must be of consequence to every nation, not excepting us of the United States, for these problems of certain of our allies, who have studied the matter, will ere many years confront us in perhaps even more serious form.

It is to be hoped that a combination of forces which will lead to a formulated expression of public opinion may accomplish this end and that we may succeed by preventive measures in avoiding the condition which France unfortunately has to acknowledge as a problem that may adversely affect her future position among the nations of the earth.

THE PROPOSED SELECTIVE DRAFT FOR PHYSICIANS

The opinion is gradually gaining ground that the volunteer system of obtaining physicians required for the military establishments of this country at war is not a satisfactory or successful means of attaining the desired ends. The necessary number of medical men to care for our troops during the stage of preparedness, while these are being made ready for foreign or other service, has not been secured by the methods employed and we are faced by the prospect of large gatherings of young men of all classes of our population, thrown together under living conditions to which most of them are entirely foreign, and improperly protected in a medical sense. Although in the end the methods of the training camp may react in a most favorable manner upon these young men of the country, yet there will be a terrible wastage by illness and perhaps even death in the process of construction of our national army. The sanitary conditions of the camps and the incidence of disease will prove a factor equally potent with the supply of munitions and other strictly military forces. The prevalence and ready spread of contagious diseases in such places is an acknowledged fact and the outbreak can only be properly guarded against by the maintenance of the proper relationship between the line and the Medical Corps. This means adequate medical supplies, it means adequate hospital facilities and personnêl, but above all it means thoroughly and specially trained physicians. Unfortunately the great and most prominent shortcoming is the latter, and how to meet this demand constitutes one of the greatest problems of the war in so far as this country is concerned. The Surgeon General of the Army has recognized the need and with the aid of the Medical Defense Council has tried to meet it. The mere fact that an individual is a physician by no means qualifies him as an Army surgeon and for this reason a wise provision has been made to give him as good a preliminary training as possible in camps of instruction, which are now being established. The problems of military medicine can thus be made more familiar by a system of intensive training which is now fairly well developed, but more human material for this purpose is still essential and now that the volunteers have not come forward in sufficient numbers there is serious talk of a resort to a process of conscription. In a way this would be a more just and equable method than that in vogue at the present time, as many men of mature years and special experience have been forced into active service who can ill be spared from home duties and who will be able to acclimate themselves to the rigors of the field with difficulty and with small result as far as their military capacities are concerned. The selective draft as proposed would affect all physicians under forty-five years of age and with the necessary exemptions it is the hope of the authorities that a sufficient number of medical men will thus be secured to properly care for the health of our expeditionary forces. The American people and likewise every professional class of the same must realize that the present is *the* war of all wars, that it is also a war against war, and "to make the world safe for democracy" is more than a mere empty phrase —it means a regeneration, a readjustment of governmental and social activities in which the medical profession, as all others, must assume an active rôle. And now that the voluntary enrollment of physicians has been tried and found wanting, we must accept the proposed verdict in a spirit of patriotism and sacrifice and that group of younger medical men who will be involved in the draft must come to an early realization of the fact that the sooner the united efforts of our people are thrown into the conflict the sooner will the final decision and the day of peace come.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 8, 1917.

The President, John O. Polak, M. D., *in the Chair.*

Dr. George W. Kosmak reported a case of

ANTEPARTUM MAMMARY HYPEREMIA ASSOCIATED WITH UNSUSPECTED MALIGNANCY.*

Dr. Daniel R. Ayres (by invitation) presented a paper on

SOME OBSERVATIONS ON THE AFTER-RESULTS OF THE INTERPOSITION OPERATION.*

DISCUSSION.

Dr. Ralph Waldo.—"I am very much interested in this operation and have performed it more than 200 times. I am glad to hear the paper because it lays stress on some important elements of technic that I learned by experience. In the first place, when Dührssen was here he came into my clinic and performed one of these operations and he made a longitudinal incision through the peritoneum, not transverse, as so many make it. I am thoroughly convinced that this is decidedly an advantage. There is another point that I believe is of great importance, that the bladder should be well separated at both sides. I have seen bladder symptoms where the operation was half done and where the bladder on side of the median line was not properly separated off and pushed each up. This can be easily done and it is very necessary. As far as I can analyze these cases from the doctor's report, and I have no criticism except a favorable one to make of his report, in my judgment the technic was faulty. Now, to have the bladder come down above the uterus shows that you do not go far enough up with your incision. You do not fasten the uterus high enough up. Dr. Ayres stated that the operation was not indicated in complete procidentia; that is, procidentia of the third degree. I take most positive issue with him there because I think where the operation is combined with amputation of the cervix and extensive repair of the perineum (colpoperineorrhaphy), it is the most efficient method of holding up

*For original article see page 444.
*For original article see page 451.

the bladder and permanently curing the procidentia. About three weeks ago I operated on a patient on whom I performed this operation six or seven years ago. The anterior wall was all right. The fault was that the perineum had not held. I simply performed a colpoperineorrhaphy and the patient is cured as far as I can tell. She has no bladder symptoms and the uterus stays where it belongs. I have never seen a bad case where these points of technic that I have mentioned were carried out. I seldom perform this operation where I expect a woman to give birth to children subsequent to the operation. There is a method, however, which can be employed and the patient allowed to go through pregnancy. I have had two of these cases that went through pregnancy and were delivered without complications. The uterus is brought forward and attached to the anterior vaginal wall; first cover the anterior surface with peritoneum to make a peritoneal adhesion instead of bringing the uterus in the wound and making a strong solid adhesion. I operated on a patient about a year ago in which an interposition operation had been performed by another man and supposed that he sterilized the patient by ligating the tubes and cutting them, but she promptly became pregnant and the symptoms were so disagreeable that about the early part of the fifth month it was necessary for me to empty the uterus."

Dr. Hermann Grad.—"The operation of uterine interposition is a very satisfactory one in a large number of cases. The reader of the paper has called attention to various conditions where the operation may not be so satisfactory. In reference to dyspareunia, the reader found that in all these cases the anterior wall of the vagina was very short. That is apt to occur in a great many of these cases but it can be obviated by utilizing the uterosacral ligaments. In every case where I have utilized those ligaments the shortening of the anterior wall of the vagina was avoided. I do not cut the ligaments away from the uterus but bring them beneath the broad ligaments out into the vagina and suture them to the anterior surface of the cervix and in that way lengthen the anterior vaginal wall. If that is done I am quite sure this particular symptom of dyspareunia will not occur so frequently. In reference to cystitis, I saw a very interesting case not long ago. A patient on whom I did an interposition operation complained of frequency of urination. I referred her to the cystoscopist and the report came back. 'Very little trigonitis present.' The cystoscopic picture of the bladder was exceedingly good. There was no displacement, no sacculation, and yet the patient complained of great frequency of urination. I had her in my office one day and while on the table she excreted six ounces of urine in four minutes and at another time two ounces of urine in five minutes. She had a polyuria. It was not a cystitis. I considered her to be a case of cystitis until I happened to find out that she was passing such enormous quantities of urine. The urine in this case was clear, there was no pus and, as the cystoscopist said, the bladder condition was unusually good, better than in the majority of these women. So in some of these cases we must take into consideration the possibility that there might be other conditions present causing the frequency of urination. In many residual urine is present. I find that when a patient has passed her urine and a catheter is used there is a retention of three-fourths of an ounce, or an ounce, and sometimes as much as two ounces of urine. I think this is a frequent source of trouble. If we can get rid of it or can do an operation which will overcome this condition many of these cases will be benefited. In regard to complete prolapse, I believe as the doctor has said, that the interposition operation it not always successful. It is better to do a hysterectomy and utilize the broad ligaments to complete a cure or else do a trisection operation on the uterus."

Dr. L. G. Baldwin.—"I desire to refer to seven cases of interposition operation that have applied to us in Brooklyn in the last two years for reoperation because of one symptom or other, chiefly a return of the condition. There were two cases where the fundus presented at the vulva."

Dr. A. M. Judd.—"I would simply say, Mr. President, that if the members would do the operation as was first suggested by Sims, further modified by Emmet, later and again further modified by Dr. Baldwin, our fellow-member, for complete prolapse, they will find it unnecessary to do the deforming operation of interposition and have absolute success with the operation for prolapse."

Dr. Daniel R. Ayres.—"I would simply say in regard to the case that Dr. Grad mentioned that all the cases of cystitis referred to by me were real cases of cystitis as shown by bacteriological examinations, which demonstrated either the colon bacillus or the staphylococcus aureus. Another thing I would like to say is that every unfavorable case that I encountered, if it were possible to find the original operator, was reported back to him so he knew what had occurred."

Dr. Charles G. Child, Jr., presented a paper on

THE AFTER-CARE OF OPERATIONS FOR VESICOVAGINAL FISTULA.*

DISCUSSION.

Dr. C. G. Ward, Jr.—"I can only say that I am heartily in accord with the line of postoperative treatment which Dr. Child has advanced. I have tried both methods thoroughly, the one of catheterizing the patient at frequent intervals and the other the self-retaining catheter. Catheterizing the patient at frequent intervals is a very unsatisfactory procedure, in my belief, because nurses are very often forgetful. Something interferes perhaps with the time that they should perform this procedure and it is not reliable. I remember one case where that method was carried out and the patient began to leak and on catheterizing her again I found she had a distended bladder. A self-retaining catheter was inserted at once and the patient promptly recovered. I have always used irrigation of the catheter *in situ* rather than the frequent removing of it. Taking out the ordinary self-retaining catheter must cause some traumatism to the delicate structures at the neck of the bladder, the trigone and urethra. I have never found it necessary to remove the catheter for clots. I am in the habit of taking a syringeful of boric acid and gently instilling that through the catheter twice a day. That serves to keep the catheter open and insures that drainage will be maintained. I can bear out what Dr. Child says about the tolerance of the bladder. For the first day or two there will be some discomfort. Opium and belladonna will usually tide the patient over, and I put these patients on urotropin and give them benzoate of soda, boric acid and peppermint water by mouth. I don't keep the catheter in longer than six or seven days, generally removing it at that time, and then start catheterizations every two hours, especially if the bladder is one that has been contracted."

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*For original article see page 455.

Dr. Ralph Waldo.—"My knowledge of this subject was obtained from Dr. Emmet. I watched him very carefully and he was very much of an advocate of the self-retaining catheter. I use the self-retaining catheter of Sims made of block tin which can be easily fitted while patient is on the operating table and Dr. Emmet was very particular about that, being very careful to see that when the catheter was being introduced through the urethra that the end did not impinge on any portion of the bladder. Another point he was very particular about, and which I have followed very efficiently, was that the catheter must be taken out each day and cleansed. That is the only self-retaining catheter that I know of that can be introduced into the bladder and can be taken out and will not produce the slightest traumatism of any portion of the bladder or of the urethra. It is an instrument that apparently has gone out of general use, so much so that there is only one instrument maker where I have been able to obtain it (Tiemann) and the last time I was there the man said to me, 'You had better get some more of these catheters because I'm not making any more of them.' It doesn't irritate the bladder, you can leave it in for two or three weeks (two weeks ordinarily), and your patients are not irritated at all by its use."

Dr. J. R. Goffe.—"It is rare that we have a paper on this subject nowadays. It recalls to my mind the wonderful contrast between to-day and yesterday, when I was a house surgeon at the Woman's Hospital, and the years following when vesicovaginal fistula was so common. It may be of interest to you to know that the Woman's Hospital was founded exclusively to cure cases of vesicovaginal fistula, and one of the early reports of Dr. Emmet gives an account of 600 operations that he had performed. I don't suppose that it comes within the experience of the members of this Society or many other societies at the present time to meet in a life time so many cases of vesicovaginal fistula. It is a strange thing that in those days we knew so little about how to handle cystitis. Dr. Emmet, as a final measure, resorted to the making of an artificial vesicovaginal fistula which, strange as it may appear, is one of the most difficult things to keep patulous. Traumatic fistula, however, is very difficult to cure, as we have all learned. I remember in my early experience making many artificial vesicovaginal fistulæ and I remember the great difficulty I had in keeping them open. The block tin catheter that Dr. Waldo has referred to was the only one in use at that time, but contrary to Dr. Waldo's account in the hospital and in my experience afterward we always had a great deal of difficulty in keeping the catheter right side up. I think nothing has contributed more to the success of operations on the bladder than the self-retaining rubber catheter used as Dr. Child has described it to-night."

DR. CHARLES G. CHILD, JR.—"There is one point which I emphasized in my paper which was not taken up in the discussion and one which I consider extremely valuable. I will emphasize it once more in closing, and that is the value of posture in the treatment of cases where the fundus of the bladder prolapses through the fistula. I have seen many cases in which the result of the operation was destroyed by this prolapse and I have seen many complicated operative maneuvers carried out to hold the fundus of the bladder away from the fistulous wound, even to the performing of a laparotomy and the suturing of the fundus of the bladder to the abdominal wall to hold it away from the fistulous wound."

DR. JOSEPH BRETTAUER.—"Something struck me very peculiarly in Dr. Child's paper. It has nothing to do with his method of closing or treating these cases postoperatively. He mentioned a case where he closed a vesicovaginal fistula in a woman two months pregnant. Was that the choice, the election for the operation at that time? I do not think I would choose such a time in a pregnant woman to close a vesicovaginal fistula. Of course, circumstances may have arisen which made that necessary."

DR. CHARLES G. CHILD, JR.—"I will answer that by citing briefly the history of this case, Mrs. C., whom I mentioned in this paper, and which Dr. Brettauer has spoken of. She called upon me this afternoon at my office and the result of the operation had been entirely satisfactory. She aborted a few days after leaving the hospital. After she arrived home (she lived quite a way out of town) she was particularly energetic, climbing step-ladders, and cleaning house, made necessary by her prolonged stay in the hospital, and I take it that that was the cause of her abortion. I would not choose this time to operate on a case of vesicovaginal fistula except there were extenuating circumstances, which existed in this case. One was the absolutely miserable condition that this poor woman was in. She had been delivered some months previously (I think sixteen months) after a difficult instrumental labor after she had been in strong pain for three days. She had not been examined by her attending physician during those three days, but at the end of this time at the strong insistence of her mother-in-law she was taken to the hospital where a consultant was called and she was delivered by forceps. From the history, I believe the fistula was a classical one due to impaction of the head in the pelvis for three days. The woman was one mass of excoriated skin, from the vagina down the legs as far as the toes, from the scalding effects of the urine leaking from this large fistula, from which she had had no relief for months. She had paid as high as $12.00 and $14.00 a month for salves and ointments to try to protect herself while waiting for the spontaneous cure which the doctor had told her would take place. She was sent to me from out of town, but the physician in giving me the history of the case made no mention or her being pregnant, and it was not until she was on the operating table under the anesthetic that I detected the increased size of the uterus and the existence of pregnancy. For this oversight I apologize to Dr. Brettauer as I have already apologized to the patient."

Dr. William M. Ford presented a paper on

OPERATION FOR PROCIDENTIA IN THE NULLIPAROUS WOMAN.*

DISCUSSION.

Dr. Austin Flint.—"Two or three years ago I began to work out with the assistance of Dr. Ford the technic of repairing perineal lacerations and was able to mobilize and expose the edges of the levator as they came down from the white line and bring them together in the median line and the result was a muscle-repairing operation with very excellent results. If you looked at these charts as Dr. Ford read the paper, it sounds more or less involved to those who are not familiar with the way we have been doing this work, but it is really easy when you think of the perineum operation modified by simply bringing these little strips of levator muscle in front of the vagina. It seems rational. In the two or three cases that Dr. Ford did, the result certainly seemed to be very good and it would seem unlikely that the bladder should come down again. It is a very valuable contribution to a class of cases where it was very difficult to get a good result by the older methods. It is simply an additional safeguard. I have always believed that these nulliparous cases of prolapse were really a hernia of the uterus where it acts like a piston in a cylinder, when the uterus has fallen back to such an extent that it is forced down and appears at the vulva and is forced out of the vagina, and is due as much to the faulty direction of the uterus as anything else. If you can change the direction of the axis of the uterus and the extreme direction of the perineal floor you cannot get this condition. This is an addition to our operative resources and it seems to me to be a very valuable one."

Dr. C. G. Child, Jr.—"I feel that Dr. Ford's technic is rather going back to the old idea of putting something under the uterus to hold it up. I do not believe that in prolapse in the nulliparous woman the perineum is at fault. These cases are due to lack of support of the uterus and, as has been amply pointed out in the past, the proper line of procedure is to utilize the normal supports of the uterus rather than work with the idea of placing a support under the uterus to hold it up. Of course, if we are going to introduce one pathological condition for another we must be sure the substitute is no worse than the condition that existed previously. Another important point is the question of the etiology of these cases. There are two types. One is the traumatic prolapse of the uterus in very young women which develops in three or four weeks and sometimes less than that. The other type is that existing in older women, nulliparous women, thirty, forty or fifty years of age, in whom there has been a gradual giving away of the supports of the uterus. Those are the most hopeless cases. The younger cases (the traumatic displacements) are the most favorable ones. I recall vividly a case of prolapse in a girl seventeen years of age developing over a period of three months, which had evidently resulted from a fall from a step-ladder, from which time she had experienced pain in the pelvis. With the next menstrual period the pain persisted and at the end of two weeks the cervix appeared at the outlet. When I saw her a month later she had a complete prolapse and the cervix protruded at least an inch and a half from the introitus. There was marked elongation of the cervix and descensus and retroflexion of the uterus. In this case the introitus had dilated and allowed the cervix to prolapse. An amputation of the cervix and vaginal fixation was performed; nothing was done to the perineum although the opening was large enough to readily hold a self-retaining speculum. The hymen was not ruptured but had been stretched. The patient made a very good recovery and in two months time the introitus had returned to normal size, and it was only with difficulty that she could be examined with the index finger; one would never believe that she had had any dilatation whatsoever. So with the levator muscles in these cases, they are not torn, but are simply stretched. It is a gradual dilatation. There is no rupture of the muscle. I feel confident the muscle will return to the normal condition when the dilating wedge (the uterus) is replaced."

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*For original article see page 438.

Dr. R. L. Dickinson.—"Any one studying that astounding series of cases of Halban and Tandler sees the anatomical reason for much of this material. In the nulliparous such prolapses are exceedingly rare. I find, for instance, in 142 cases in the index of private cases only five belonging in the two classes, which they usually do. One was a young woman, a Pratt Institute instructor, who had been very athletic and had done very hard work at basketball and whose cervix protruded through the hymen. The use of a pessary for three months resulted in entire recovery. As the case had apparently existed for only three or four months treatment resulted in a complete return to normal of her athletic ligaments and she needed no more care. She subsequently married and had a child and there wasn't even a retroversion in her case. The other four cases were in women, fifty, forty-five, sixty-two and fifty-five years of age. The most picturesque case was that of the woman fifty years old. She had strained violently all her life in having bowel movements. The posterior vaginal wall protruded nearly the size of the fist full of bowel with a vaginal interocele six inches in length, four inches of which protruded from the vulva. She had had two vaginal patchings by a general surgeon and refused further operation. The patient of sixty-two had a uterus which was two-thirds out and five inches of it had been out for three months. She also was a nullipara. The patient of fifty (these are all intelligent women, not the laboring class, but ladies whose troubles have been due to strains in labor), the last one operated on, had a uterus which protruded two-thirds of its length from the vagina and when a vaginal hysterectomy was done she had a large rectocele, the lining of the culdesac extending to the ramus and coming down into the peritoneal body. Another case examined in that way has seemed to have the same reason: she had a somewhat heavy fibroid with a very long cervix. The anatomical deformity is like a deep colostomy in the small bowel and it may have no small part in the causation of these cases. In these old women the pelvic floor is poor and rigid. I would like to say that such operations in these cases are unsatisfactory, it being impossible to pick out the levator and sew it on both sides of the opening. The study I have made shows that in certain people there is a poor quality of muscle and the wall itself is much elongated in the prolapse cases."

Dr. H. N. Vineberg.—"I would like to call attention to recent observations in these cases showing that in a large number of them there is a spina bifida occulta. In the congenital cases the spina bifida occurs visibly and those cases usually succumb to the other defects. I had a case recently in which, in addition to prolapse, which might be considered congenital, there was a very marked prolapse of the rectum. In that case I took advantage of the operation which is recognized as Dr. Moschowitz's operation for prolapse of the rectum and found in that case, as Dr. Dickinson has said, a very deep culdesac and it was exceedingly difficult to get down at the bottom and pass the circular sutures so as to bring up the rectum. The obliteration of Douglas' culdesac elevated the uterus and in addition I suspended the uterus by suturing the round ligaments to the abdominal wall. I have seen the patient twice since the operation and the result so far has simply been perfect. The rectum does not come down at all. Before that it was constantly out. This woman was of poor intelligence and I believe in most of these cases in which the condition is congenital that the degree of intelligence is rather below par."

Dr. William M. Ford.—"I am sorry if I did not make myself clear on all points. Numerous details were omitted because it appeared to me that with the broad knowledge of gynecological technic possessed by members of this Society further details might bore you.

"To take up the discussion. Dr. Child states that he does not believe the perineum is at fault and that there are no normal supports in these cases to hold up the anterior vaginal wall. I quite concede that in the cases which came under my observation there was no injury to the perineum. It is this missing or inadequate anterior support which I endeavor to supply by uniting the levators in front of the vagina.

"'It is not a normal condition to have the levators united in front of the anterior wall of the vagina'—that I admit; and it is 'substituting one pathological condition for another,' but this pathological condition certainly in the cases which I had under observation resulted in no physical inconvenience to the patients. It certainly gave the patients a decidedly happier outlook on life than they experienced before they were operated upon, and the 'pathological condition,' to my mind, is no more abnormal than a vaginal fixation, which Dr. Child says he resorts to.

"The approximation of the muscles alone is not sufficient to give adequate support, but approximation of the muscles is necessary to a proper result. To get my meaning you will have to recall that the pelvic diaphragm, rising posteriorly, comes forward with the two halves practically joined in the midline until it reaches the vagina. At this point the right and left halves diverge to their respective insertions in the rami of the pubes thus forming a triangular space with its apex posterior just behind the vagina, its base forward at the symphysis pubis and its sides formed by the diverging inner margins of the right and left levators. The floor of this space is partly formed anteriorly by the fascia underlying the base of the bladder and in this space are found the vaginal and urethral openings. The approximation of the diverging levators in front of the vagina and beneath the bladder (and its inadequate supports) is for the purpose of maintaining the muscle fibers apposed until the fascia covering the lower surface of the pelvic diaphragm has been given an opportunity to unite.

"To go back to the case that Dr. Dickinson speaks of, in which there was an acute prolapse which was cured by the use of the pessary. It is perfectly logical to reason that this represented a 'giving way' of the anterior supports, that her perineum remained intact and that when he put a pessary in it acted as a support and held the cervix well up and back so that the fascia underlying the bladder had a chance to reunite (the fibers having been only temporarily acutely separated) thus bringing about a spontaneous cure.

"The muscles in older women are admittedly weaker than in younger women but in the cases in which I did this operation, parous and nulliparous, the muscles were adequate in every instance. The advantages of the operation will be more apparent after a brief study of the diagrams."

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Stated Meeting, Held May 22, 1917.

Dr. George W. Kosmak *in the Chair.*

The subject of the meeting was

"PRENATAL CARE."

Dr. Kosmak opened the meeting with a brief introductory address, in which he outlined the purposes for which the meeting was called, as follows:

"The subject of prenatal care is one that demands the attention of the physician, the pathologist, the research worker, and that large class of the laity interested in public welfare work. Although the close association between the mother's general condition and the subsequent career of her offspring has been acknowledged for many years, it is only within comparatively recent times that any effort has been made to influence the well being of the child by attentions directed to the mother during her pregnancy. In the past we have rather been interested in gross developmental errors as shown in fetal monstrosities and even this study has been marked by speculation rather than careful observation. There is very much more in this prenatal field to be studied than gross malformations and errors in the maternal organism may result in effects on the fetus that do not become manifest in this plainly evident way and may not disclose themselves until later in life.

"It is interesting to remember that during the period of intrauterine life, which takes up scarcely more than 1 per cent. of mans' subsequent biblical limitation of three score years and ten, there are crowded into this brief time a series of morphologic changes and developments that are much in excess of anything that occurs subsequent to birth. This was well shown in a paper read by Dr. Schumann of Philadelphia before this section only a few months ago, in which he also called attention to the fact that within the short space of forty weeks the microscopic ovum united to the equally microscopic spermatozoon grows into an organism eight or more pounds in weight, with all its viscera and systems of viscera completely organized to maintain life, and further that in this period are laid down the potentialities for the indefinite continuation of the species. It must be evident to every one, therefore, that the relative importance of antenatal life should be regarded as of the greatest moment to the welfare of the race. Dr. Schumann also called attention to the fact that between the intrauterine existence of the fetus and postnatal life there lies the mechanism of parturition and the twelve hours or more which the fetus spends in traversing the birth canal may well be regarded as the most momentous epoch in the life of the individual and one fraught with dangers and of accidents, any one of which may entirely change the subsequent course of its life. It may also be possible to trace a definite relationship between maternal illness and its effect on the subsequent life of the child. Thus it has been stated that a mother suffering from the toxemia of late pregnancy may give birth to an infant which, although affected with the protein poison at the time, eventually recovers and grows to maturity. It may be perfectly fair to assume therefore that an individual of this kind manifests a lessened resistance to metabolic disturbances as compared with an individual in whom a profound protein poisoning had not occurred before birth. There are numerous other examples which show the close interdependence of antenatal pathology to postnatal conditions and it is necessary that more careful attention be accorded to this period than has hitherto been extended to the same. The study of antenatal pathology is still in its infancy and the diagnosis of antenatal disease a practically virgin field, the latter due to the fact that observations on the pregnant woman conducted in a detailed fashion have not been a routine procedure, so that if a mother gives birth to a diseased infant the previous conditions associated with the case have not been sufficiently noted. As far as antenatal therapeutics are concerned, we are also treading on virgin ground. The general hygiene of the mother has been considered sufficient and aside from the prevention of syphilis and hemophilia little has been accomplished by way of therapeutic measures. It is quite evident therefore that any attention which we can give to the subject of prenatal care is of great importance to the community and to the race, and it is only by calling attention to the need for the same that we can hope to arouse and educate the profession as well as the public. Preventive medicine constitutes one of the most satisfactory and remarkable developments of the past few decades and in no field can this be more profitably employed than in that which forms the subject of this evening's discussion."

Dr. Ralph W. Lobenstine read a paper entitled

THE DEVELOPMENT OF SYSTEMATIC CÖORDINATE OBSTETRIC CARE AMONG THE POOR OF MANHATTAN ISLAND*

Dr. A. B. Emmons, 2d, of Boston, read a paper by invitation on

PRENATAL CARE, A FERTILE FIELD FOR RESEARCH.†

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*For original article see page 381.

† For original article see page 401.

Dr. Grace L. Meigs, of Washington, D. C. (by invitation), presented a study on

MATERNAL MORTALITY IN THE UNITED STATES AND ITS RELATION TO PRENATAL CARE.

DISCUSSION.

Dr. J. Clifton Edgar said: "We are not entirely without prenatal clinics in New York. For sometime in connection with three maternity services in which I am an attending physician we have been carrying on prenatal work. Although our follow-up system is as yet imperfect it is gradually being improved. These three hospital services are Bellevue, the School for Midwives, and the Manhattan Maternity. At Bellevue we had 57 new cases applying for prenatal care in January, 33 in February and 49 in March. In January 90 visits were made, in February 42, and in March 54. In the school for midwives we had in January 84 new cases; in February 122 and in March 151. There were 295 home visits made in January, 186 in February and 226 in March. We have been making an inquiry into the causes of stillbirths. Statistics show that over 4 per cent. of children die during birth. Of 14,468 births at the Manhattan Maternity from April 1, 1905 to October 1, 1916 there were 519 stillbirths, or almost 3.6 per cent. This includes both hospital stillbirths and home stillbirths. We determined whenever possible the cause of death, and any contributory or doubtful influence sufficient in itself to cause death. We noted the condition of the pelvis and the presentations which added to the risk of childbirth, the various operative procedures, and the autopsy findings. An attempt was also made to determine the number of stillborn children in which the risk was not so great as to preclude the survival of the child, had the mother been seen during pregnancy and her confinement properly managed. The chief causes of stillbirths in this series were as follows: Unknown, 149; obstructed labor, 78; protracted labor, 32; precipitated labor 10; cord conditions, 65; placental conditions, 47; maternal diseases, 44; fetal conditions, 65; unstated 10. Among those classed as unknown it was not to be inferred that there was no idea as of the cause of stillbirth. Of these 149, 90 were simply recorded as macerations, while 19 others were premature which were also macerated. Of these 500 cases 123 were operated on.

"A detailed consideration of all the data included in these statistics lead us to a few general conclusions. We deplore the absence of the routine employment of the Wassermann test, which has only within the last three months been made a rule of the hospital service. The total number of autopsies made was small, namely 67 of the 500 cases. How many of the 149 instances of stillbirth, or of the 25 instances where the autopsy findings was asphyxia from unknown causes had pituitary extract as a contributory cause we do

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* For original article see page 392.

not know, but we know that in the early days of its introduction far too many cases of asphyxiated children occurred, and this has led to a more conservative use of the remedy.

"The great lesson which this study of 500 instances of stillbirth teaches us is the need of antenatal observations and care of the patients. It is difficult to persuade the patients of the upper classes that such care is imperative; it is often impossible to so convince the tenement house patient. In the hospital from which these cases were taken, we maintain a daily antenatal clinic, to which patients are directed to report and send specimens of urine. In connection with Bellevue Hospital Obstetric Service we hold an antenatal clinic twice a week. Our results in this connection are far from satisfactory, often deplorable. Within a month a patient applied to this clinic in a condition of advanced toxemia, and admitted to the obstetric ward and died of eclampsia. Eclampsia and advanced toxemia are mostly preventable conditions. The twenty-four eclampsias and nineteen toxemias in our series are too many; they were mostly preventable. In regard to the number of cases in which children might have been born alive under favorable auspices, many of the protracted labors could be included, especially when neglect or delay figured in the case. The precipitate labors might be added, and some of the dystocia cases. Toxemia and eclampsia might have been averted in a goodly proportion of the cases. All of the syphilitic cases, and these must have been far more numerous than the figures show, might have been averted by the early treatment of the mother. It is by no means unlikely that at least 100 babies might have been saved, and even this unseemly high number may be too small a computation. Roughly speaking about one woman in four in the total series of stillbirths required operative interference.

"In general there is need for a standard report blank for stillbirths, adopted by some health board or obstetrical society.

"One of the most hopeless problems confronting us is the elimination of prematurity as a condition resulting in stillbirth. Of their sixty-nine cases of prematurity a third, or twenty-three cases, have prematurity alone as the condition of stillbirth. The cause of the stillbirth in the remaining two-thirds of the premature cases is accounted for by syphilis, toxemia, or both coexisting, placenta previa, precipitate labor, prolapse of the cord, hydrocephalus, hydramnios, an atelectasis. The tenement house woman is especially prone to abortion and premature labor. This cannot be charged up to physical or psychical shock to the mother. External injury or shock play little part as a causative factor. In only one of our 500 observations is there a mention of a fall on the part of the mother, and it is added "no hemorrhage followed." Nor can the cause be laid to overwork or physical strain such as the tenement house woman is greatly exposed to. The real underlying cause of prematurity among tenement house women, and this holds true to a less extent only among the so-called upper classes as well, is the too early getting about after confinement, before involution is more than partially accomplished. Syphilis can be treated, toxemia and eclampsia prevented, obstructed labor foreseen, protracted labor relieved, operative technic improved, but the prevention of subinvolution in the tenement house woman who insists in returning to her daily tasks with a few weeks after confinement, for the time being, appears entirely hopeless.

"Allowance must be made for an undoubted and unaccountable tendency to fetal death, such as is seen in stillbirths under the most favorable conditions; nearly 5 per cent. of stillbirths are thus explained. If we assume that 100 of these 500 babies could have been saved we must also assume that a fair number could never have been saved under the most favorable conditions these constitute an irreducible minimum. The key-note to the further reduction of stillbirth mortality among the so-called upper classes as well as the tenement population would read: "Better general obstetrical care with special reference to close antenatal observation."

Dr. J. M. Slemons, New Haven, Conn.—"The broad question really we have come to discuss is the better practice of obstetrics. Into the problem various factors enter and it is highly important that we recognize prenatal care to be but one of them. Another factor of equal importance is the proper attention of the patient at the time of labor.

"When prenatal care is satisfactorily carried out four things are accomplished: First, there is a lower death rate among the infants; second, there is a lower death rate among the mothers; third, there is a larger percentage of healthy children born, and fourth, the mothers are discharged with fewer gynecological complaints. These results are, however, not due exclusively to prenatal care, though as Dr. Emmons has said, the woman who has been given prenatal care is much more likely to receive proper care at the time of confinement, and this of itself would justify carrying out all the principles of prenatal care emphasized here to-night. If from what I have said you think me skeptical as to the value of prenatal care I will convince you that this is not the case by telling you that of the sum of money given me for running the Department of Obstetrics and Gynecology in the Yale Medical School, 20 per cent. goes into prenatal work and the care of patients at the time of labor. We find that it costs us approximately $15 per case to visit these women preliminarily and give them proper care at the time of confinement.

"Now, the question is, in order to get this proper obstetrical care, where are the funds to come from. They may be given, first, by individual philanthropists or, second, as state appropriations, or perhaps from both sources; at all events we have the problem to face, where are the necessary funds to come from? I believe they may be had for fortunately we can assure donors who will consider devoting this money to this work that the returns will be very high. The physician it seems to me, has no higher duty than that of encouraging individuals to help with this work, the adequate supervision of women during pregnancy, labor and the subsequent period of convalescence.

Mr. H. M. Larson (of the New York Milk Committee).—"Much has already been said about the problem of prenatal care and a great deal has been said of the results of such care, but I cannot resist showing you a chart of the infant deaths in New York City per 1000 births from 1911 to 1916. During the period the infant mortality in New York City has been running from 135 per 1000 births in 1911 to 93.1 for 1916 (Fig. 1). The reason I show these charts is that they demonstrate that the milk stations have accomplished definite results, but the milk station has not yet found the infant under one month of age, the period during which the infant mortality is the highest, totalling the number of deaths over one

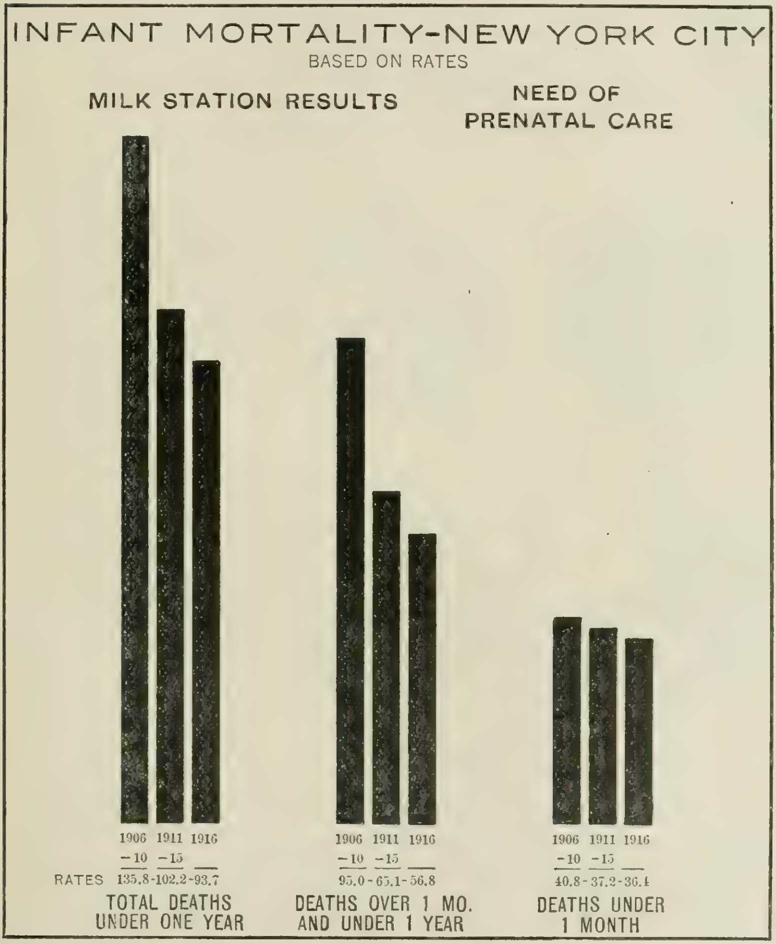
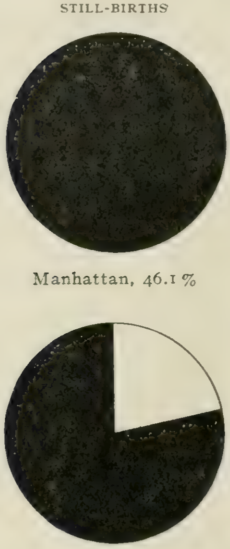
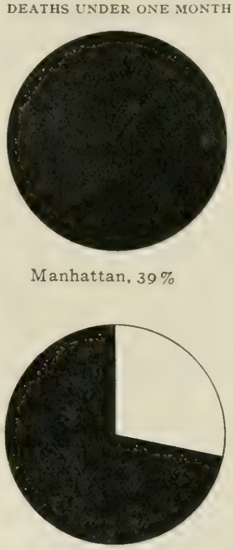


Fig. 1.

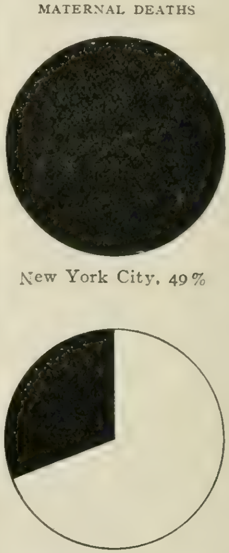
month and under one year. So far as the reduction of the deaths in infants under one month is concerned we are practically at a standstill. The members of the New York Milk Commission realize that something must be done for the expectant mother and that we will have to get the mothers before confinement in order to take care of the infants under one or two months. They therefore started the experiment of carrying on prenatal care of expectant mothers in connection with the work of the milk stations in nine districts. They had also introduced the idea of prenatal care into the health centers. Comparing the supervised cases with the unsupervised cases in the Borough of Manhattan, we find a reduction in the number of stillbirths of 22 per cent. (Fig. 2) and a reduction in the number of deaths of infants under one month of 28 per cent. in favor of the supervised cases (Fig. 3). Out of 3145 women who received prenatal care there were but five deaths, a maternal death rate of 1.5 compared with the maternal death rate of New York as a whole of 4.9. As has already been brought out, in 1913, Dr. Emerson appointed a committee to make suggestions with reference to prenatal and obstatrical care. Whether by design or not I do not know, but he selected men connected with the New York Milk Committee. The members of the Milk Committee had had this subject under consideration for some time previous to this. In studying the problem of giving prenatal care to all the people, we investigated hospital and dispensary facilities. We found that while the hospital service extended from one end of Manhattan Island to the other there



Prenatal cases, 36 %
Reduction, 22 %
FIG. 2.



Prenatal cases, 27.9 %
Reduction, 28 %
FIG. 3.



Prenatal cases, 1.5 %
Reduction, 69 %
FIG. 4.

were no restrictions whatsoever as to districts. It seemed to us that the problem with which we were dealing was very similar to that presented by tuberculosis. As you know that problem was met by districting the city and starting tuberculosis clinics. If tuberculosis could be handled by districting the city, why not apply the same principle to the problem of prenatal care? This map of Manhattan which I am showing you (see page 388) was not districted by us as a scheme of applying prenatal care, but is the map of the Department of Health showing the so-called "Sanitary Areas." Following these same boundaries in a plan for prenatal care would offer the advantage that we would always have the statistics of the Department of Health for comparison and guidance. We have also taken into consideration the location of hospitals in connection with these sanitary areas and their facilities for obstetrical service. By taking into consideration the facilities of the various hospitals and dispensaries for in-service and out-service we have found it possible to work out a zoning plan that will work absolutely no hardship to any hospital in the city. A comparison of the figures of the various hospitals with reference to the amount of in-service and out-service, shows, however, that there will have to be some very intensive study and adjustment of zones in order to get the most satisfactory arrangement, and to see that no hospital suffers. As has been pointed out, our intention has not been one of antagonism to any hospital or practitioner. Our organization is helpless of itself and unequal to coping with the situation; the only way we can make an impression is by coöperation. If we can get the different hospitals and dispensaries, milk stations, diet stations, Strauss stations and other agencies that have nursing facilities to work together we may then get somewhere in working out a plan for prenatal care."

Dr. John O. Polak.—"The situation in Brooklyn is more difficult than in New York because we have no public maternity hospitals and no coöperation from the city. It is also more difficult to get money in Brooklyn than in New York. But we have not been inactive. Three years ago we started a clinic at the Long Island College Hospital for prenatal care and have had the privilege of having 3200 women under our care and of following them to their confinement. There was but one death in this series, and there has not been a single case of toxemia of pregnancy that has been permitted to go into eclampsia. The visiting work has been done by three physicians and two nurses. When we first started the work we attempted to cover every part of Brooklyn, but this was found too large an undertaking and we confined our district to that in which the hospital is located, the district between Fulton Street and Third Avenue and the River. In order to get into close touch with the women in our follow-up work we not only had as antenatal clinic but a postpartum clinic as well. Our postpartum clinics are of great interest. The women come back two or three times and look upon this clinic as their advisory board. They appreciate the extreme care they are receiving and are willing to allow us to use them for clinical teaching, thinking that the extreme care they are getting as a justification for the examination.

"Another thing which has impressed us very much in this work is how very little interest the public takes in it. Notwithstanding speaking at a number of women's clubs we have been able to stimulate almost no interest in the subject at least so far as financial support is concerned. The public has not been aroused out of the belief that pregnancy and labor is an absolutely normal process; we have been trying to teach that it is not a normal process unless properly cared for under present social conditions, and it is not normal in this country where the blending of races tends to make it more and more abnormal every day. I feel that much has been done in lowering the mortality from childbirth in private practice, but the capacity of hospitals available for maternity cases is still very inadequate."

Dr. Haven Emerson.—"I came here not to speak but to see what has been accomplished by this committee which has done more than any other committee which had undertaken to plan for prenatal care and bostetrical work. There is no section of the Academy which has not been called upon to make some contribution to public health work, and the duty of the obstetrician in this direction has been pointed out very clearly. While it is very certain that the city cannot go into obstetrical work, yet I cannot agree with what has been said of the hopelessness of the situation when we look at the uncared for cases and the premature births. It seems to me that it is quite possible that we may expect a little help from the city. The city contributes money for the burial of the dead why should it not contribute to the expense of being born, if the cost of being born is only fifteen dollars, as Dr. Slemons says it is in New Haven? Certainly a city like New York could make some contribution for this purpose. But the city cannot do these things until the public asks for them. The only way to get these things is through publicity; the Department must wait until certain groups of citizens make known the need and back it up. It is unbecoming in the Health Department to keep prodding a group of specialists who should take the lead to initiate a program of curative obstetrics. If we have the weight of the influence of the obstetricians and the public back of this movement there will be no question but that we will get the money.

"The contribution of the Health Department to this work lies in teaching the value of this service and in directing people to competent practitioners of medicine, and in cases in which a physician is not available to put them into the hands of someone who knows how to be surgically clean; that is one real contribution which the Health Department makes in its supervision of midwives.

"In dealing with some diseases it is not practical to district the city; for instance it is very doubtful if a plan of districting the city would be of any use in dealing with venereal diseases, but it is an ideal plan for a prenatal and obstetrical service. I cannot believe that hospitals would be unwilling to make the individual sacrifices that might be necessary to such a districting of the city.

"Voluntary maternity insurance offers another way of meeting the need for better obstetrical care. If a family spends from 5 to 10 per cent. of its income on beer there is no reason why it should not spend a little for cleanliness, surgery in an emergency, milk and other necessities.

"I am inclined to think there has been no greater contribution to a constructive program for public health work than that presented here this evening and I hope this section will make of itself a committee of the whole and do what may be necessary to further the plans presented. It is unfortunate that obstetrical work in New York is not coördinated. The plan to reach 100 per cent. of obstetrical cases is interesting. The first intensive step in this direction has been made in Manhattan; this is because the social conception of the value of preventive medicine has been developed to a greater extent than in other boroughs, and it is one of the greatest assets of the city."

DR. JAMES W. MARKOE.—"The question of obstetrics in New York City is one in which I have been much interested for many years. In teaching clinical obstetrics I was almost a pioneer and when I was called upon to organize the work of the Sloane Maternity, obstetrics belonged to the province of general medicine; it was not a specialty and there was but one private clinic teaching obstetrics in this city at that time. After seeing the out-door work in the Boston Lying-In I proposed that the teaching of obstetrics should be augmented by adding to the work of the Sloane Maternity, an out-door service modelled after the one I had seen. As this proposal was not accepted I decided to start an independent institution and in 1890 organized the present Lying-In Hospital. In the beginning there were associated with me in the work at the Lying-In, Doctor Lambert, Doctor Edgar, Doctor Flint and Doctor Painter. It has, at all times been very difficult to secure money to carry on our work and the one man who gave a large sum of money, honestly believed that if he built a large maternity hospital, the people would recognize its value and come forward and support it. That was his opinion, but he was mistaken for the public has never supported it. Mr. Morgan gave $1,250,000 to build and equip the Lying-In Hospital and now twenty-eight years since we started the work, the expenses are about $200,000 a year, $100,000 of which the present Mr. Morgan donates. At the time the work was started the cases that came to us came mostly from midwives and were frequently brought to us in desperate condition.

"I recall one instance in which the woman was dead and the child was left in with one leg pulled off. I recall another instance in which two loops of the intestine were pulled down and cut off. These conditions have entirely changed. The percentage of such desperate cases is now small. Doctors are doing much better than they did and midwives have learned to send those cases into the hospital. It is not fair to deprecate the care given obstetrical cases in New York as it is far advanced as any other city in the United States in this respect. This question of prenatal care is a question of money and of money only, and when the Henry Street nurses offered to take care of our prenatal work for $75 a month for each nurse supplied the question was submitted to the Board of Directors and to the Ladies' Auxiliary, but they could not support the plan as the funds have been entirely inadequate to carry on this kind of work as complete as we desire. At the present time we have three nurses doing this work.

"We have about 7000 cases a year and the mortality and morbidity rates are not high. I am sure that our educational work among doctors and nurses have given good results. I think we are also doing a good work in educating the people and if we can get them to save their pennies and invest in maternity insurance as suggested by Commissioner Emerson, it will be a very valuable step in the right direction. I have a postnatal clinic every Sunday morning and the patients like it so well that they ask if they may not come back for information and examination.

"If the city can be so divided into districts that each maternity hospital will be able to care for the cases in its particular district it may prove an excellent plan."

DR. ROSALIE SLAUGHTER MORTON.—"I would like to ask Dr. Emmons about the work at the New England Hospital for Women and Children. That was one of the first institutions to have a training school for nurses and the first to establish a prenatal clinic. They must have done something of value in this work from which we might learn a great deal."

DR. EMMONS, closing the discussion, said.—"I hesitate to say much about the New England Hospital for Women and Children because only women physicians are allowed in that institution and I have only been there once to see a patient. It has always appeared to me that the New England Hospital was not taking much interest in prenatal care; they have been trying for a time to get funds for a new hospital building and that has absorbed their energies, and there seems to have been some difficulty in their getting funds to carry on the prenatal work.

"I want to say one thing that I think will be of interest to you. Dr. Meigs has shown that the maternal mortality has been actually rising whereas such diseases as typhoid fever, tuberculosis, pneumonia and diphtheria are still showing a falling mortality. New York is the only large city in this country which has reversed that process and is showing an improvement in the maternal mortality. In 1905 New York showed a maternal mortality per 100,000 population of 20.3; in 1913 of 14.1, while Boston, in 1905, showed a maternal mortality of 14.1 and in 1913 of 20.6."

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Annual Meeting, Pittsburgh, May, 1917.

(*Continued from August Number.*)

SYMPOSIUM ON RADIUM THERAPY. METHODS AND RESULTS OF RADIUM TREATMENT OF UTERINE HEMORRHAGE DUE TO OTHER CAUSES THAN MALIGNANCY.

Dr. Howard A. Kelly, of Baltimore, in behalf of himself and Dr. Curtis F. Burnam, presented a report on 100 cases of uterine hemorrhages treated with radium and radium emanation. He pointed out how frequently doctors were consulted for this troublesome symptom and how weak the therapeutic arm had been, in that so many patients were subjected to a hysterectomy when curettage failed.

Radium therapy here was as simple and as safe as a dilatation of the cervix, and consisted in nothing more than introducing a uterine sound with a hollow tip containing 500 millecuries of emanation and applying it successively to some eight different points in the uterus, fifteen minutes at each point. This practically always cut short the menstrual function, and so simply obviated the need for a hysterectomy.

In young women, as shown by several cases reported, the menstruation could sometimes be modified without even suspending it. In one case pregnancy and delivery of a healthy child followed the treatment.

Seven of the 100 cases cited had heart disease, two epilepsy, two insanity, others Bright's disease and tuberculosis, manifestly bad risks for hysterectomy. No serious sequelæ followed the radium treatment.

Also practically in all cases of fibroid tumors, radium had checked the monthly flow completely when desired. In young women it had been possible in some instances to cause the tumor to disappear without stopping menstruation permanently.

RADIUM IN THE TREATMENT OF UTERINE HEMORRHAGE AND FIBROID TUMORS.

Dr. C. Jeff Miller, of New Orleans, stated that while it had been shown that the early extravagant claims as to the curative powers of radium in cancerous lesions had not been verified by subsequent analysis of case reports, it had developed that its effect in the treatment of uterine bleeding from various causes was almost that of a specific. Its most striking effect was its certain control of uterine bleeding due to the metropathies, or aberrant ovarian function. Aggravated cases of the menopause, usually relieved by hysterectomy, could be controlled by a single application of radium. Similar results were obtained in bleeding complicating fibroids of the uterus and certain types of fibroids might disappear or markedly shrink. Radium would not supersede surgery in the treatment of fibroids. Large growths giving rise to pressure symptoms, or presenting evidences of degeneration, as well as submucous tumors, should be treated surgically, if operation was not contraindicated. When desirable to preserve the function of the generative organs in young women, surgery should be considered the more conservative procedure, since it permitted myomectomy.

Its effect in controlling bleeding associated with chronic metritis and polypoid endometritis was equally satisfactory, and when the dosage and screening were carefully measured, it might be used as a last resort in excessive bleeding in young girls, without causing cessation of the menses. Itching associated with kraurosis of the vulva, as well as pruritus, could often be promptly allayed by radium.

Statistics to show the primary and ultimate results were necessary to prove its real therapeutic value. Result of its use during a period of three years showed that the primary results in controlling uterine bleeding were nearly 100 per cent., the ultimate results varying according to the times and number of exposures.

RADIOTHERAPY IN UTERINE HEMORRHAGE OF BENIGN ORIGIN.

Dr. John G. Clark, of Philadelphia, said that in cases of hemorrhage of the uterus of benign origin, such as that from small myomata or myopathic change, particularly in women over thirty-eight years of age, radium in small doses was one of the most effective remedies relieving practically all of the cases from even the slight hazard to a major surgical operation. The hemorrhages in such cases stopped promptly and with rare exceptions permanently, without untoward effects incident to the use of radium. Analysis of cases, according to age, indicated that those near the menopause responded best. Cases in former years, in which even repeated curettages failed to alleviate the hemorrhage, were promptly terminated after the application of 50 milligrams of radium for twenty-four hours. In over 100 cases there had been but one failure to relieve the hemorrhagic symptoms in these cases.

RADIUM IN UTERINE CANCER.

Dr. Harold C. Bailey, of New York City, in his paper discussed the present status of radium in the treatment of uterine cancer, followed by a detailed description of the technic used at the Memorial Hospital in 1915–16, and gave the account of a new method or adaptation for filtering the rays which had been gradually developed and had been adopted as the regular technic since January 1, 1917.

The platinum applicators holding large amounts of radium emanation were placed in an iron capsule containing mercury. This mercury "bomb" offered efficient protection to the normal tissues and permitted of the entire lower part of the pelvis being swept with a sufficient dose in a period of usually not more than four or five hours. In addition, heavy applications were made over the lower part of the abdomen in three areas and directed toward the upper part of the pelvis. In this manner, from the standpoint of the amount of radiation, three or four times the dose possible with the ordinary technic could be directed into the pelvis and without subsequent irritation.

He gave a general description of 125 cases treated since January, 1915, the accessary treatment, the amounts of radium used and the results to date.

DISCUSSION.

Dr. Francis Carter Wood, of New York City, said that he had had but little personal experience with the use of radium in the treatment of uterine hemorrhage. Those cases he had seen had suggested the necessity of an accurate preliminary diagnosis of the condition of the endometrium by the thorough microscopic study of curettings removed with care so as to obtain as large fragments as possible and promptly preserved. Without such precautions in obtaining the material, a satisfactory study was often impossible. He had seen a few cases treated in which the radium did not cause a cessation of the hemorrhage until such doses had been administered as to cause atrophy of the ovaries. As to the treatment of fibroids, he felt from his pathological experience that only a moderate percentage could be properly handled by radiation. It must be remembered that after extensive radiation hysterectomy, should it prove necessary, might be very difficult, owing to the cartilaginous fibrosis of the parametria.

Dr. Herman J. Boldt, of New York City, said that he wished to refer to hemorrhages from benign causes. While radium had certain advantages, he had failed to hear the final results from its use. Similar results might be obtained from the proper intrauterine application of chlorid of zinc. The advantage of radium was that less applications might be necessary. One might obtain a result after one or two treatments which might require a dozen treatments by chlorid of zinc. Radium might cause less pain than chlorid of zinc, but the proper application of a 50 per cent. solution of chlorid of zinc in the form of an intrauterine tamponade, would bring about a result equally as good as that by radium so far as the cessation of hemorrhage was concerned.

Dr. Ernest C. Samuel, of New Orleans, stated that when the hemoglobin was low, he had found that a smaller dosage of radium spread over a longer period of time produced less toxic symptoms than a large dose over a shorter period of time. He was glad to have heard a statement by one gentleman that he had found only two or three per cent. of toxic symptoms as the result of radium applications. That had not been his experience. Almost 90 per cent. of patients that he made intrauterine applications to or applications around the cervix, developed a distressing nausea and vomiting and some elevation of temperature.

Dr. Henry Schmitz, of Chicago, believed that the radiotherapist who used small amounts of radium obtained as good results as the man who used larger amounts. In benign conditions he used less milligrams of radium, and the physical condition of the patients was much better than we found it in malignant conditions. The malignant cases very frequently showed advanced cachexia and anemia. Their resistance was materially lowered, and in such cases it was necessary to use larger amounts of radium rays than in nonmalignant conditions.

Dr. William P. Graves, of Boston, had noted one thing which had not been mentioned in this symposium, and that was, the successful reaction of the cancer cells to radium depended considerably upon the histologic structure of the cancer. Cancers that were purely squamous in type, starting from the portio vaginalis, were much more favorable to treatment. Those cases which originated in the endocervix, that was, adenocarcinoma of the cervix, did not respond in the same way.

ETIOLOGIC STUDY OF VULVAR CARCINOMA.

Dr. Frederick J. Taussig, of St. Louis, Missouri, stated that the fifteen cases upon which this paper was based were observed, with but one exception, at the Barnard Free Skin and Cancer Hospital, in the services of Dr. Gellhorn and himself. Eight of their patients received deep *x*-ray treatment, four of them with the Coolidge tube, but in none was there more than a very temporary improvement. They had come to the opinion that the *x*-ray could only be considered as an auxiliary to surgical measures in vulvar cancer. They had no radium to use, but it was difficult to see how its results could have been any better in view of the early and extensive involvement of the lymphatic system in these patients. There remained, therefore, only radical surgical removal as a therapeutic agent.

It was difficult to work out a definite style of operation for a condition that was encountered so rarely as cancer of the vulva. However, through various untoward results, such as frequent glandular recurrences in the femoral ring, extensive postoperative necrosis of the vulva, inguinal infections, local implantation metastases, he had recently adopted the following two-stage operation technic:

1. Dissection of the entire superficial and deep inguinal and femoral lymphatic chain by the method of Basset. This method consisted of an incision opening the entire inguinal canal and subperitoneal spaces in the iliac fossa superior to the external iliac

vessels. After this chain had been lifted out, attached to the round ligament, the femoral glands were dissected out around the saphenous and femoral vessels. Now came the point of special value. Poupart's ligament was cut across over the femoral ring and the deep gland situated beneath it freed with its attendant fat and lymph vessels. The round ligament was then tied off at its entrance into the peritoneal cavity and the entire lymph gland mass excised. The deep epigastric vessels had to be ligated close to their point of origin in order to permit of a clean dissection. The femoral ring was closed by suturing the internal oblique to the femoral fascia, Poupart's ligament was then sutured over this, and a small drain placed in the deeper subperitoneal space. In all instances both sides should be cleaned out by a separate incision in this radical manner. The primary tumor of the vulva was kept away from the operative field in the inguinal region during and after this first operation. Only a sterilizing dose with the Coolidge tube and ordinary antiseptic treatment were employed to keep it clean.

2. Two weeks later the inguinal wounds had healed, usually by first intention. He then proceeded to an excision of the vulva, using neither scalpel nor scissors, but only the cautery-knife. No attempt was made afterwards to close the wound entirely by a dissection of flaps. Instead, a half dozen silkworm-gut sutures alone were used to approximate the skin edge. Thus a considerable surface was left denuded. No dressing was kept on the wound after the patient was back in bed. Under the open air treatment, with the occasional assistance of dry heat and the frequent irrigation of the vulvar wound with Dakin's solution, he had obtained rapid granulation, and none of the necrosis and infection that otherwise in his experience had been uniformly associated with these extensive vulvar excisions in old women. He believed this method of operation had distinct advantages.

ADENOMYOMA OF THE RECTOVAGINAL SEPTUM.

Dr. Thomas S. Cullen, of Baltimore, said that these growths were usually situated in the vaginal vault directly behind the cervix. They soon became adherent to the rectum and later might spread out into the broad ligaments.

Histologically, they consisted of nonstriped muscle and fibrous tissue. Scattered through the growth were islands of uterine mucosa. He referred briefly to his previous papers on the subject and then reported two cases. The first tumor was small and situated in the usual position. The second case was unique. Posterior to the cervix several small polypi projected into the vagina. On histo logicalexamination they were found to be typical adenomyomata covered by vaginal mucosa. Both broad ligaments were board-like and at each period the patient had pain in both renal regions. At operation both broad ligaments were also found involved by the adenomyoma. The ureters were markedly dilated in the pelvis, each being 1 centimeter in diameter. Where they passed through the broad ligaments they were markedly narrowed by the adenomyomatous growth. Near the bladder they were of nearly normal caliber. The pain in the kidney regions at the periods was undoubtedly due to the increased compression on the ureters by the adenomyomatous tissue that naturally swelled at the time of menstruation.

The ureters were liberated; the uterus with a portion of the vagina was removed. A portion of the growth was left attached to the rectum and in both broad ligaments. The patient was later treated with radium.

GASTROINTESTINAL CONDITIONS IN WOMEN

Dr. Charles A. L. Reed, of Cincinnati, Ohio, stated that the chief distortions of etiologic and pathologic significance to which he invited attention had occurred under his observation in approximately 3000 cases during the last eleven years. They were mentioned in their relative order of frequency as confirmed by both physical examination, *x*-ray records and surgical exploration. The colon, ptosic, retardatively angulated, sometimes redundant, occasionally adherent, was the most frequently observed seat of distortion. Next was the cecum, dilated, flabby, hypermobile, often adherent, but more frequently covered with highly organized exudate. The ileum was often ptosic, angulated near its cecal end, dilated back of the angulation, and the seat of marked stasis. Adhesions of the terminal ileum were of frequent occurrence, while Lane's kink was occasionally encountered. He recently had four in succession. The ileocecal valve was sometimes incompetent. The duodenum, always dilated in the presence of constrictions or angulations at the terminal ileum, was also frequently enveloped in a highly organized exudate and frequently adherent. The sigmoid or pelvic colon was often redundant and was sometimes the seat of constrictive narrowing at its juncture with the descending colon. The vermiform appendix was generally normal, but was sometimes either adherent, atrophied or distended, only occasionally being the seat of active mischief. Chronic intussusception with adhesions of invaginated surface had been encountered. Diverticula and neoplasms, both benign and malignant, of the intestinal wall had been observed. The fat, often really lipomatous, omentum found in these cases had a demonstrated etiologic relationship to displacement of the colon and stomach. The stomach was generally found vertical to the left side, often of the fishhook type, sometimes extremely ptosic, and not infrequently the seat of adhesions to the mesocolon. Pyloric insufficiency occasionally with active ulceration of the pylorus or duodenum or both, was encountered. Another condition of great importance, but really secondary to the distortions mentioned, was that of general visceral cyanosis, the veins, more especially of the mesocolon and the mesentery, were greatly dilated and filled with very dark blood showing circulatory stasis with resulting dangerous deoxygenation of the considerable quantity of blood thus impounded. It was to be understood that these conditions were rarely, if ever, found singly just as it would be obviously improbable that all of them should exist in the same case at the same time. It was also to be remembered that certain of these conditions, as, for instance, a more or less marked ptosis of the colon, or certain adhesions, or even marked redundancies, might exist without producing symptoms. It was only when marked symptoms did exist, and when they were logically and obviously referable to the conditions enumerated, or to any of them, that the latter were to be recognized and treated as pathologic within themselves and etiologic with reference to secondary or other sequential phenomena. In any event the conditions enumerated were sufficient to show that there was abundant pathology in the cases under consideration.

As to treatment, it was essential to remember that the practical problem, so far as it was presented in the course of gynecological practice, was distinctly three fold, namely, the intestinal condition, the constitutional state, and the gynecologic sequelæ or complications. As to the intestinal condition, it should be carefully determined in the routine diagnosis of every case; it should be recognized as initial pathology, and should be treated in accordance with its specific indications. This did not mean that every case should be remanded for operation. Other methods of treatment should be recognized as available in certain of the milder cases in which the ptosis was not pronounced or of long standing, or in which the constitutional conditions were not yet severe. The constipation, or its sequel, demanded first attention. Mild solvent laxatives and a diet less in protein and rich in cellulose, with intestinal antisepsis, associated with alkaline lavage of the large bowel were indicated. The most important treatment of this class of cases was prolonged rest in bed with passive exercise and forced nutrition was a balanced dietary. If the intestinal distortions were marked, and especially if they were associated with adhesions, surgical intervention was demanded. Surgery should always be adapted to the specific indication presented, and it should always be applied on the principle of the minimum of surgery with which to meet the object in view. Acting on this principle, he had had occasion to break up adhesions, to relieve angulations, to remove redundancies, and to extirpate functionally dead segments of the intestine. The procedures involved had embraced appendectomy, appendicostomy, cecostomy, parietal implantation of the colon, resection of redundant transverse colons, resection of redundant sigmoids, removal of the right colon with end-to-end anastomosis, ileosigmoidoscopy, with colon exclusion, and ileosigmoidoscopy with secondary colonectomy. In certain cases shortening of the mesocolon and the mesentery was done by peritoneal plication.

(*To be Continued in October Number.*)

REVIEW.

GYNECOLOGY FOR STUDENTS AND PRACTITIONERS. By THOMAS WATTS EDEN, M. D., F. R. C. S., F. R. C. P. (Temp. Major, R. A. M. C.), Obstetric Physician, Charing Cross Hospital; Joint Lecturer in Obstetrics and Gynecology, Charing Cross Hospital Medical School; Surgeon, Chelsea Hospital for Women, Etc. Etc., and Cuthbert Lockyer, M. D., B. S., F. R. C. S., F. R. C. P. Assistant Obstetric Physician, Charing Cross Hospital; Joint Lecturer in Obstetrics and Gynecology and Lecturer in Practical Obstetrics, Charing Cross Hospital Medical School; Surgeon to In-Patients, Samaritan Free Hospital for Women, Etc., Etc. With 513 illustrations and 20 colored plates. The Macmillan Company, New York, 1916. Price $8.00 net.

In writing this book the authors have attempted to maintain an even balance between the pathological and clinical aspects of the subject and believe they have attained this result by collaboration between two writers. The pathological features of gynecology have therefore been given considerable attention and both the macroscopic and microscopic illustrations of various lesions have been freely employed. Moreover, they are largely original, having been prepared from specimens in the Lockyer Collection of the Charing Cross Hospital. The authors have seen fit to widen the scope of the work by including a description of appendicitis and also by devoting considerable attention to the subject of the results of obstetric infections. The book is divided into three portions; the first taking up the general features of gynecology, the second regional gynecology, and the third operative gynecology. Pathological classifications have been rejected because they involve to a greater or less extent the disassociation of conditions which are in close clinical relation. The work as a whole may be designated as presenting a very complete and satisfactory description of the subject of gynecology. Considerable space is given to the description of chronic endometritis and the authors believe that the title should be limited to conditions which fulfill certain criteria that are briefly as follows: mucus within the cells of the glands, polymorphonuclear leukocytes in large numbers, round-celled exudation in the superficial muscular layers, plasma-cells in abundance; new vessels, many with thick walls, invasion of superficial muscle by some of the tubules of the endometrium, fibrosis of stroma, with glands reduced in size, and thick-walled blood-vessels. In every instance they consider that endometritis is essentially the result of an inflammatory process, which starting in the premenstrual stage has prevented the normal involution of the glands from taking place. In addition to the true infectious types they also describe certain other "allied conditions," including glandular endometritis, atrophic endometritis, simple adenoma and exfoliative endometritis which they do not consider as fulfilling the criteria already referred to. In describing the pathology of chronic ovarian inflammations the authors also demonstrate that from the clinical point of view the important changes wrought by chronic inflammation, with the exception of two, concern the unripened follicle and not the corpus luteum.

In the section on operative gynecology the various methods employed are carefully described and illustrated, a sufficient number of procedures being referred to for all practical purposes. The book as a whole may be commended, especially to the practitioner of medicine, as presenting a very satisfactory and complete account of the science of gynecology.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Twenty-ninth Annual Meeting, White Sulphur Springs, W. Va., May 28, 29, 30, 1917.

The President, DR. FRANK SPOONER CHURCHILL, *Chicago, in the Chair.*

(*Continued from August.*)

PEDIATRICS.

Second Day, Tuesday, May 29, 1917.

CASE REPORT SESSION.

A CASE OF PRECOCIOUS MENSTRUATION.

DR. WILLIAM PALMER LUCAS, San Francisco.—This case might have been entered under the name of precocious menstruation or equally as well under the appellation of linear nevus. The patient showed an interesting skin lesion and very marked keratitis.

This patient was a girl, nineteen months of age when first seen. There was one other child in the family. The family history of the father and mother was entirely negative.

The following points are of interest in connection with this case. The patient developed her first tooth and sat up when six months of age. She talked when one year old and her first menstruation started when she was fifteen months old. She had a slight bloody flow from the vagina and at that time was more irritable than usual. There was no history aside from this.

The physical examination showed a coin-shaped spot on the head and a raised linear lesion between the nose and the lip on the left side. It was yellowish in color, verging into brown, and resembled a keratitic condition.

As to the rest of her physical development, it was found that she had well developed mammæ showing a slight watery secretion. Her sugar tolerance was good. She showed a somewhat advanced development of the small bones.

Phychologically her intelligence was normal but she was precocious in respect to her phenomenal attention. She did systematically things that would be difficult for a child three or four years of age to do.

DISCUSSION.

Dr. Howard C. Carpenter, Philadelphia.—There are some cases of polypoid sarcoma of the vagina reported in children in which there has been a certain amount of hemorrhage, so before making a diagnosis of precocious menstruation the possibility of neoplasm must be carefully looked into.

A CASE OF HEMORRHAGIC DISEASE IN THE NEW-BORN TREATED BY DIRECT TRANSFUSION.

Dr. J. H. Mason Knox, Baltimore.—On March 6th I was called to see an infant, two days old, because that morning it had vomited a considerable amount of bloody fluid. The family history is unimportant. The mother is perfectly well, thirty-four years of age. She had one miscarriage shortly after her marriage twelve years before and was threatened with miscarriage when about three months pregnant with this baby. She had two healthy children ten and four and one-half years of age. The birth was spontaneous. The child weighed 7 pounds 6 ounces. Two meconium stools passed the first day of the baby's life and two the second. On the third day the baby nursed well in the morning and about 9 A. M. vomited a considerable amount of dark, blood-stained fluid. There was no fever or cough. When seen shortly afterward nothing abnormal could be made out. During the examination the child passed from 3 to 5 ounces of tarry-stained material, evidently a hemorrhage from the intestinal tract. It was at once concluded that the case was one of melena and transfusion from the mother was determined upon. About 50 c.c. of the mother's blood was received into 2 ounces of sodium citrate solution. With a syringe about 15 c.c. of this was introduced into the longitudinal sinus, and the remainder was administered intramuscularly into the buttocks. From 9 A. M. to 3.30 P. M. the child passed several tarry stools, was greatly blanched, pulse became thready, and respiration shallow. With complete rest the condition slightly improved and the following morning the child seemed better. At 7 A. M. 2 drams of the mother's milk were given and repeated at two hour intervals. The following day the baby had one hemorrhage from the bowels, not accompanied by any change in pulse or rise in temperature. The material was darker than before and probably a part of the original hemorrhage. The following day the baby had two yellow stools and from this time made an uninterrupted recovery. At the present time the child seems to be perfectly normal.

DISCUSSION.

Dr. Fritz B. Talbot, Boston.—One of the interesting features in these cases is that they frequently have a high temperature at some stage of the disease. I have wondered whether in certain instances in which the hemorrhage is under the scalp or in the muscles, where it is not excreted, the high temperature may not be due to the absorption of the hemorrhage and not to infection. I had one case in which there was a profuse hemorrhage under the scalp and a temperature running from 102° to 106° F. This was a typical case. Recovery took place.

Dr. Alfred F. Hess, New York.—This brings up the question of which is preferable, direct or indirect transfusion, and whether one is as good as the other. In my mind the matter stands thus: Direct transfusion is the treatment of election. I believe direct transfusion is better than citrated whole blood. Temperature reactions occur with citrated blood. I think the final investigations show that citrated blood is not the same as whole blood.

Dr. Henry F. Helmholtz, Evanston, Ill.—Most of these cases will recover without direct transfusion. They can be cured, as Zingher has pointed out, by intramuscular injections of blood which can be given in amounts up to 100 c.c. The blood can be injected into the new-born without any difficulty and the majority of new-born bleeders can be cured in this way without transfusion.

Dr. Charles Gilmore Kerley, New York.—I have had three cases within a half a year entirely relieved by intramuscular injection. One-half an ounce injected into each buttock stops the bleeding just as effectually as the use of serum by the Welch method. The fact that blood can be obtained so readily for infants and the fact that one does not have the difficulty of separating the serum makes this method a very convenient as well as a very satisfactory one.

Dr. L. E. La Fetra, New York.—Ever since Dr. Schloss published his method of giving the intramuscular injections of whole blood, I have been using that method. We have used it in some fifty cases, making the injection into the loose tissue in the scapular region. This method possesses the advantage that when the mother comes to see the baby we can use her blood. It obviates the difficulty of hunting a donor and does away with the fear that the father will be kept from work. We do not have to use large quantities of blood. It is more important that the injections be made at frequent intervals. If human blood cannot be obtained, horse serum may be used.

Dr. J. H. Mason Knox, Baltimore.—The reason the blood was injected into the vein was because the child was in extremis, pulseless, and almost dead. We wanted a quick response.

SKIAGRAM OF A CASE OF IDIOPATHIC DILATATION OF THE COLON.

Dr. J. P. Crozer Griffith, Philadelphia.—This patient a little boy four years old, complained of discomfort, but did not vomit and there was no blood in the stools. The circumference of the abdomen was 21 inches. The *x*-ray showed marked peristalsis and an enormously dilated colon. It was with difficulty that I was able to stay the hand of the surgeon. We used pituitrin and dietetic measures and I argued that as the boy was in good condition it was better to treat him medically than to shorten the colon. What his future will be I cannot say. I believe that a resection of the colon is the proper procedure where the patient's condition is serious. I have stayed the hand of the surgeon in some cases in which the condition was an acquired one and have seen the patient get well without operation. These cases, must, however, be distinguished from cases of pyloric stenosis.

DISCUSSION.

Dr. Fritz B. Talbot, Boston.—We all know the poor results of surgery in these cases. In our cases I have been watching the result of a treatment, and the same thing has been done elsewhere, that is the use of a well fitting elastic belt that compresses the lower abdomen. I think this method of treatment should be tried out in a large number of cases so that we may find the actual value of this method. Our results have been very encouraging.

Dr. L. Emmett Holt, New York.—A distinction should be made between Hirschsprung's disease and marked intestinal indigestion. I think that in the mind of the general practitioner these two conditions are often confounded in children. I saw a case in which it was thought the symptoms were caused by a long colon and the surgeon was going to operate. This child went under the care of a physician and gained 8 pounds. Simply because the *x*-ray showed a dilated colon that surgeon was going to operate; this is a mistake frequently made. The results of surgery in these cases Dr. Talbot has brought out. In many cases an elastic band gives the needed support to a thin abdominal wall. Where there are no signs of ulceration and the child is in fair condition the indications are to stay the hand of the surgeon, since a good many of these cases will get well even when the distention is very great.

Dr. Griffith.—I wish to emphasize that distinction must be made between the cases in which there is stricture and those in which the dilatation is due to intestinal indigestion. Many cases have been reported in which surgery has been a failure and many more have not been reported. Again many cases thought to be due to stricture have been found at operation or at autopsy to be purely idiopathic dilatation of the colon and not in need of surgical interference.

THREE CHILDREN WITH SPORADIC CRETINISM IN ONE FAMILY.

Dr. Charles Herrman, New York.—This is the second time I have had the opportunity of presenting three cases of sporadic cretinism in one family. The first series of cases was published in the New York State Journal, August, 1914, and consisted of two boys and a girl. The three patients now presented are twenty-two, twenty and eighteen years respectively and have been under treatment intermittently since they were three years old. The eldest was seen by Osler in 1898 and the other two by Thayer and Smith. There is no family history of any disease of the thyroid or any other of the endocrine organs. The mother has been pregnant twelve times. These cretins were the third, fourth and sixth births. The ninth and tenth pregnancies miscarried. These children were born in this country, and the pregnancies and labors were normal. These children were breast fed for from eight to sixteen months, the first teeth appeared at one year, they were able to sit alone at one and one-half years and to walk at three years and speak short sentences. At the age of two years it was noticed that they did not develop properly physically and mentally. At the age of three they were taken to Johns Hopkins Hospital and were treated intermittently for several years. The older girl began to menstruate at seventeen years, the younger at fifteen. These children came under my observation in March, 1917. At that time their mental and physical development was greatly retarded. The roentgenographical examination showed delayed ossification in all, but hardly as much as one might have expected. At eighteen to twenty years union should have taken place between the bases and shafts of the phalanges, the heads and shafts of the metacarpals and the epiphyses and shafts at the lower end of the radium and ulna. The general appearance of the children was that of cretins who have been under treatment intermittently. These patients have now been under treatment for two and one-half months with a combination of the extracts of thyroid, pituitary, and suprarenal glands, and have shown marked mental and physical improvement.

In only five of the fifty cases of cretinism coming under my observation were the parents related. A distinct history of constitutional disease is not more common in these families than in others. Tuberculosis, syphilis and malaria are usually absent. It is also seen in these families having more than one cretin that normal children were born between the abnormal. It seems very unlikely that a constitutional disease in either parent would manifest itself in only one of twins yet we have observed cretinism in one of twins, or that a mother so affected would have alternately a normal and an abnormal child. It seems to me that these anomalies of the ductless glands can best be explained on the basis of heredity. The defect is not necessarily of the thyroid or pronounced. Family pedigrees are usually incomplete or inaccurate and it does not follow that because we cannot elicit a history of such a defect, that therefore none existed.

DISCUSSION.

DR. JOHN RUHRAH, Baltimore.—Have you ever seen a case of cretinism that remained perfectly normal in adult life?

DR. ROLAND G. FREEMAN, New York.—I have been very much interested in a case of cretinism. This individual was entirely irresponsible and had to be put into an institution. I also know of another instance in which the individual could not adapt himself to the ordinary conditions of life and was a great trial both to himself and to his family.

DR. GODFREY R. PISEK, New York.—I do not think these cretins are ever cured or ever get beyond the moron stage. They have to be kept under thyroid treatment for years.

Dr. Henry Heiman, New York.—I have had the opportunity of observing a case of cretinism for years. We were obliged to give him thyroid after he was apparently well. He went through school and was graduated from high school. He has reached a height of five feet ten inches and is now a book-binder. In these cases the after treatment must always be continued.

Dr. D. J. Milton Miller, Atlantic City.—I have had the opportunity of observing a case of myxodema at about the time of the menopause. This woman has been under observation for over twenty years and has never recovered. This woman takes intermittent treatment of thyroid and has taken it for two years at a time.

Dr. J. P. Sedgwick, Minneapolis.—We had a case of congenital cretinism last winter. I am very much interested in knowing whether congenital cases are common and whether the rest have seen them.

Dr. Charles Herrman.—The results of treatment depend upon how early treatment has been instituted. In one case I began treatment when the child was but one month old. This is the patient to whom Dr. Heiman has referred and who is now about twenty years of age. In a second child in the same family treatment was begun at about fifteen months. This is a sister and she is practically normal. She has gone to school and has stood well though not the best in her class and is practically normal physically. Some of these cretins reach a normal standard physically but never mentally. If we can get these cretins early and treat them long, they may not be absolutely normal but they become near enough normal to go into business and to go through life fairly well. The majority of cases are not treated until they are a year old and then it is too late to expect to get good results.

THE RESTORATION OF MATERNAL NURSING AFTER SIXTEEN DAYS OF COMPLETE INTERRUPTION.

Dr. Thomas S. Southworth, New York.—The most important issue in this case was the fact that if the breast milk had not been restored in this instance the infant would have died. The baby was born December 9, 1916, with a reported weight of 9 pounds. It seemed that as a result of the forceps operation at the time of birth the infant's left ear was black and blue and there was a deep mark on the forehead. Nine days after birth severe cellulitis developed which involved the right buttock, the entire lower part of the back from the ribs to the sacrum, and the under surface of the chin and upper part of the neck. There was also a profusely suppurative otitis media of the left ear. Owing to the erysipelatoid appearance of the cellulitis about the chin, the baby was removed from the breast on December 20, and the mother allowed to return home. The suppurating areas were freely incised. Two weeks elapsed during which time the mother made no attempt to pump her breasts or retain her milk. She then decided to take the baby home as it seemed probable that the baby would die if it did not receive breast milk. She began taking 1 pint of cornmeal gruel, and 1 quart of milk daily, following definite instructions. At first complementary feedings of malt soup mixture were given after each nursing. After a few days these were stopped and the breast milk sufficed. At this time the infant weighed only 6 pounds and 11½ ounces. From this time the progress was slow but fairly continuous, and he has gradually overcome his various infections, though the otitis media persisted until about the middle of March. While the restoration of breast milk after a complete interruption for sixteen days is perhaps not so remarkable, it is well that we should be reminded of its possibility. The measures adopted to this end undoubtedly played some part in the success of the effort, and the urgent need of the baby in this instance made its accomplishment a matter of especial gratification.

DISCUSSION.

Dr. Charles Herrman, New York.—I have a chart of a case that demonstrates the possibility of resuming breast feeding after an interval of ten weeks. In this instance the baby was born in a maternity ward and it was found that the mother had uterine trouble and required operation. She remained in the hospital until the child was thirteen weeks old. The child was artificially fed and gained nothing. When the mother came out of the hospital after an interval of ten weeks she started nursing the baby again. At first the baby was partly breast fed, but gradually the mother's milk became normal in amount and the baby's weight became normal. It is rather important to remember that in mothers who have stopped breast feeding it can be resumed if a persistent effort is made.

Dr. Sedgwick, Minneapolis.—I wish to endorse Dr. Southworth's remark where he said it was well to be reminded occasionally of the possibility of resuming breast feeding when it had been interrupted. This is one of the most important things in pediatric and general practice. I had one case in which breast feeding was resumed after an interval of nine weeks. In this instance the mother had erysipelas. We also had another case last year in which nursing was resumed after an interval of two months. A case has been reported in which breast feeding was resumed after an interval of three or four months. Instances have been published in which a grandmother or a virgin aunt have been called upon to suckle a baby.

Dr. Howard C. Carpenter, Philadelphia.—I am reminded by Dr. Sedgwick's remark of an instance that came under my observation. A mother and her daughter were each nursing babies at the same time. The babies were not thriving. I took the daughter's baby and put it to its grandmother's breast and took the mother's baby and put it on its sister's breast, and both babies thrived remarkably well.

A CASE OF CONGENITAL HEART DISEASE.

DR. CHARLES HUNTER DUNN, Boston.—The clinical report was that of a case in which the diagnosis of congenital cardiac disease was obvious from the physical examination of the heart. The presence of a palpable systolic thrill, of persistent cyanosis, and of cardiac enlargement, suggested the presence of pulmonary stenosis. The fact that the child survived for fifteen months suggested the presence of some additional compensating lesions, either defective ventricular septum or open ductus arteriosus. The absence of the humming top murmur, or the transmission of the murmur into the vessels of the neck suggested the additional lesion was defective interventricular septum rather than open ductus arteriosus. The clinical diagnosis in this case was as follows: Pulmonary stenosis, defective interventricular septum, chronic intestinal tuberculosis, chronic tuberculosis of the mesenteric lymph nodes, possible tuberculous peritonitis, rickets, and terminal bronchopneumonia. At autopsy the heart showed very marked enlargement. The point of origin of the aorta and pulmonary arteries respectively were reversed, the aorta rising in front and to the right, and the pulmonary artery behind and to the left. The foramen ovale was entirely open. The tricuspid and mitral valves were normal except for the widening of the orifices produced by the dilatation of the ventricles. There was some hypertrophy of the wall of the left ventricle, and marked dilatation of the cavity of the right ventricle without notable hypertrophy of the walls. The aortic orifice was situated, not in the left ventricle but in the right ventricle somewhat further forward than the normal position of the pulmonary orifice. The pulmonary orifice was situated in the left ventricle in the position normally occupied by the aortic orifice. It showed marked stenosis. There was an oval opening in the ventricular septum 5 cm. in diameter situated in the usual position of the lesion. The principal interest in this case lies in the transposition of the great vessels, which is a comparatively uncommon lesion in congenital cardiac disease.

There are two forms of transposition of the great vessels. In the one form the aorta arises in front and to the right, while the pulmonary artery arises behind and to the left, but each vessel arises from its proper ventricle. This form is called correct transposition. In the other form not only is the position of the origin of the great vessels reversed, but the aorta opens from the right ventricle, and the pulmonary artery from the left ventricle. This is called complete transposition, and is the form found in the present instance. In most of the reported cases the lesion has been accompanied by other lesions. There are a few reported cases in which the complete transposition was the sole lesion. In these cases the only clinical manifestation was persistent cyanosis, there being no murmur and no cardiac enlargement.

The most plausible explanation of the lesion is that of Rokitansky. In the conus arteriosus which forms the upper part of the primitive aorta, the formation of the transverse aortic septum places the lumen of the aorta in front. The torsion which brings the opening of the aorta behind is due to a kinking in the bulbus cordis, which forms the lower part of the primitive aorta and pulmonary artery. This torsion is represented by the spiral arrangement of the septum in the bulbus cordis. If this normal kinking and torsion does not occur, or is slightly reversed, the aorta will arise in front and to the right, the pulmonary artery behind and to the left. In the first form of transposition there is a sympathetic adjustment of the interventricular septum in its union with the aorto-pulmonary septum, which causes each great vessel to open into its proper ventricle. This form is called by Rokitansky "corrected" transposition. In the second form the interventricular septum unites with the malposed aorto-pulmonary septum without sympathetic adjustment, causing the aorta to open from the right ventricle. This is called complete transposition. The remarkable feature of this case is that the child should have lived so long, especially with the additional handicap of abdominal tuberculosis. The transposition of the great vessels must produce serious disturbance of the circulation. The only way in which any venous blood can be aerated is by passing through the open foramen ovale or open ventricular septum into the left side of the heart, often being sent out through the narrowed lumen of the pulmonary artery.

DISCUSSION.

Dr. J. P. Crozer Griffith, Philadelphia.—I think a case similar to this of Dr. Dunn's was reported in our former Transactions. I think the case was one of transposition but I am not sure to what degree correction occurred.

A CASE OF MENINGOCOCCUS MENINGITIS IN THE NEW-BORN, WITH INTERESTING AND UNUSUAL FEATURES.

Dr. J. Milton Miller, Atlantic City.—This patient at two weeks of age developed slight fever and a purulent conjunctivitis which was thought to be gonorrheal. It, however, cleared up under argyrol, but the fever continued. On the abdomen and upper right thigh and groin a number of giant vesicles developed some two weeks later. For ten days the patient had these symptoms but no nervous symptoms and no vomiting or convulsions. The reflexes were negative, leukocytes 21,000, culture from the jugular vein negative. The continuous fever 101° to 103° F. was attributed to the bullæ, whose contents had become clouded. After the symptoms had continued for about a month lumbar puncture was performed. The first lumbar puncture was dry; the second brought about 30 minims of clear yellow fluid which coagulated at once into firm, jelly-like clot. Examination was for this reason unsatisfactory. At a fourth lumbar puncture a few days later only 1 or 2 drops of fluid were obtained and this coagulated in the needle. Finally the signs developed which made the diagnosis of meningitis apparent. The patient was treated with Flexner's serum. Two withdrawals of one-half ounce of ventricular fluid were followed by the introduction of 20 c.c. of Flexner's serum. The child's general condition remained unchanged. A few days later 1 ounce of fluid was withdrawn from the fontanel and 20 c.c. of serum introduced. Several similar injections were given after the withdrawal of fluid. Finally, an attempt to wash out the spinal canal with saline solution through two needles of different levels failed, fluid refusing to enter the canal. Other punctures and serum injections were made, but the patient finally died. Autopsy showed a suppurative meningitis; sections did not show the presence of the meningococci. The following features seemed to me of particular interest; 1. The onset with conjunctivitis, mistakenly regarded as gonorrheal. 2. The bullous eruption in the second week of the disease. 3. The prolonged latent period before signs of meningitis were apparent (fourth week). 4. The peculiar character of the spinal fluid. It gelatinized at once upon withdrawal. Dr. Kolmer said the condition of xanthrochromia and massive coagulation was very unique and uncommon in meningococcus meningitis. It is found in various chronic conditions bringing about space constriction in the spinal circulation, with congestion and stasis of the spinal fluid. 5. The large number of punctures of the fontanel, ten, in so young a patient, with no apparent ill effect beyond vomiting. 6. The large amount of serum introduced 260 c.c. in all with no sign of serum disease. 7. The remarkable sclerema of the skin persisting throughout the attack. 8. Apparent improvement after the tenth injection of serum, with subsequent return of symptoms and death

ACCIDENTS IN FOREIGN PROTEIN ADMINISTRATION.

Dr. Charles Gilmore Kerley, New York.—The first patient was a boy eight years of age who had suffered from asthma since he was two years of age. He was sensitized to rag weed maple, golden rod and horse serum. We tried to immunize him to horse serum giving him one-half minim doses. This was followed by a local reaction but no constitutional symptoms. At two week intervals the treatment was repeated, until 4 minims were being given. The child suddenly showed extreme pallor and all the symptoms of anaphylaxis. Recovery was slow but complete. Maple pollen still gives him severe asthma.

The second case was that of a girl, seven years of age, who suffered greatly from asthma and was found to be sensitized to wheat, oats and barley. She responded to injections of these proteins by a local reaction, a large wheal forming at the site of the injection. One day after having received treatment she suffered from a very violent reaction just after leaving the office. Presumably it was the protein injection that was responsible.

A third case was that of a baby who responded to the scratch skin test for milk. She was given 8 drops of Walker-Gordon milk and went into collapse. Her condition, however, was not as severe as that of the boy who was sensitive to horse serum, and she made a good recovery.

DISCUSSION.

Dr. Fritz B. Talbot, Boston.—These three cases bring out very interesting facts. In the first case the patient was sensitized to horse serum by anaphylaxis. If we want to sensitize a person we repeat the injection once in two weeks; if we want to immunize we give the injection every third or fourth day. That would explain how the symptoms of sensitization were obtained in the first case. It is curious that many children react to the emanations of the horse and not to the serum. The horse serum protein is probably in both the serum and the excreta, whereas there is another protein in the emanations of the horse which is not present in the serum.

These cases bring out the danger of treatment by serum unless one has studied the fundamental principles of anaphylaxis very carefully.

The second case that reacted to wheat, oats and barley brings up the interesting problem of mass reactions. Where there is a tendency to react to one of a group of foreign proteins, particularly in the vegetable world, there is also a tendency to react to the other members of that group. If one member of the wheat family produces a reaction all members of the wheat family react.

We have found another peculiar thing. If wheat produces a reaction and we stop wheat and feed barley instead, after feeding barley for two weeks, the barley will produce a reaction and the wheat will not.

Dr. D. J. Milton Miller, Atlantic City.—I do not believe anyone should undertake the treatment of these cases unless he is familiar with the use of these proteins. I had a case of asthma in which I used the skin tests for wheat, barley and casein. The mother said the child could not take egg. I gave that child white of egg and inside of ten minutes wheals appeared and the child had a very severe attack of asthma. The child became cyanosed and the attack was only controlled by a hypodermic of morphine. I think a child of that kind should be sent to someone accustomed to treating this condition.

Dr. Talbot.—The feeding of foreign proteins is safer than giving them subcutaneously. We have no fatal cases on record from giving them into the gastrointestinal tract, though an erythema may be produced, but when the proteins are given under the skin there have been fatalities.

Dr. B. Raymond Hooble, Detroit.—I have had several of these cases and have found just what Dr. Talbot says, namely, that if the protein is given by the mouth in tablet form we can obtain desensitization with safety. We have just finished a series of tests in which we started as low as 10 milligrams and gave up to 50 milligrams in some instances before the reaction was shown. We made the scratch test with white of egg or put it on the mucous membrane of the tongue. Then we used a little white of egg boiled and we gradually increased the amount until the child could take a teaspoonful without bad result. Every day some egg must be given until immunization is complete.

We have also made injections per rectum, particularly in the type of cases not able to take cow's milk without developing an erythematous eruption. One may give the milk by mouth reducing it to a very small quantity and giving it with other foods and can thus by giving very small quantities and very gradually increasing the amount one may after three or four months obtain desensitization. In this type of cases one may by means of a small rubber bulb introduce an ounce of milk per rectum every day without trouble.

DR. J. P. CROZER GRIFFITH.—Can we regard all the reactions we get as protein reactions? For instance, would you regard a reaction to strawberries as a protein reaction?

DR. FRITZ B. TALBOT, Boston.—It seems to me we can explain all these reactions under the one head of protein reactions. There is no proof that there is anything else that causes anaphylaxis, and it is up to those doing this work to show that fats or carbohydrates can do it. The pure protein can be obtained from all vegetables, though it is frequently present in extremely small amounts.

DR. GODFREY R. PISEK, New York.—I want to emphasize a practical point and that is that it sometimes takes a longer time than has been mentioned to produce desensitization, sometimes it takes as long as six months. I have known of several instances in which children were sensitized to egg and desensitization was produced and then the mother stopped giving egg for a time and when the egg was again given there was a return of the symptoms.

DR. DAVID M. COWIE, Ann Arbor.—Professor Novie speaks of the ability to overcome anaphylaxis by rendering the urine alkaline by the administration of potassium acetate and he reports a group of cases that have been cured by the alkaline treatment. We have had a large number of cases of eczema that have improved under antianaphylactic treatment.

DR. FRIEDLANDER, Cincinnati.—I have been following the work of Dr. Novie. All the cases have received large doses of alkali and these cases show a greatly diminished incidence of serum diseases following the use of the serum treatment.

DR. CHARLES GILMORE KERLEY, New York.—The discussion has wandered a little from "accidents." Altogether I have sifted out and treated 107 cases and have had only a few accidents. I appreciate what has been said with reference to producing immunization by giving the protein by the way of the stomach. This route was not practical where the child was sensitized to horse serum. I have simply reported these cases to demonstrate that in the matter of protein therapy and our experiments with proteins our procedures should be very carefully carried out.

A CASE OF APPENDICITIS IN A NINE MONTHS' OLD BABY, WITH AUTOPSY RECORD.

DR. ISAAC ABT, Chicago.—This child had always been delicate. He was admitted to the hospital with a history of having had bronchitis off and on and doctors had said that he had a slight heart murmur. The physical examination showed throat slightly injected, tongue coated, slight cyanosis of face and lips. The respiratory movement apparently interfered with. There were harsh breath sounds throughout the chest, no dulness or bronchial breathing heard, a few small moist râles over the lower left lobe. The heart examination was negative also the abdomen and extremities. At autopsy there was found a perforating appendicitis. For a time after treatment the child appeared to improve, then the pulse became imperceptible and the child died. There were no symptoms whatever of appendicitis.

A CASE OF PNEUMOTHORAX IN A TWELVE-YEAR-OLD BOY.

Dr. Isaac Abt.—This boy's history was negative until three weeks before admission to the hospital. Four days before admission he began to be troubled with dyspnea. A needle was inserted into the thoracic cavity with catheter attached. Later an incision into the thoracic cavity was made, and a tube inserted. The following day the right side of the chest and abdomen became swollen and the following day the chest became edematous. The temperature gradually rose to 105, the pulse was 145 and the respirations 56. The emphysema became very general and the child died.

DISCUSSION.

Dr. William Palmer Lucas.—I would like to ask if any one has had the opportunity of seeing a pneumothorax in a new-born child?

Dr. J. P. Sedgwick, Minneapolis.—We see the infants just after they are born, and just a month ago we had a case which on the second day developed a marked pneumothorax. This child slowly recovered. We had a series of *x*-ray pictures taken which showed a marked pneumothorax in the beginning and then a daily diminution. We were unable to find out what had caused the pneumothorax in this child.

Dr. DeWitt H. Sherman, Buffalo.—I would like to refer to a case that does not correlate with Dr. Abt's. We have been taught that we should aspirate the chest when fluid was present. I had a case of pneumonia which was followed by an empyema. The chest was aspirated and this was followed by emphysema that went down the right side across and up on the other side, and death ensued in a short time. It was a case that impressed me very much with the danger of aspirating the lung even when the aspiration was very carefully done.

Dr. Henry J. Gerstenberger, Cleveland.—Was the opening in the chest large enough so that it could be kept open, and did it permit a return of the displaced viscera to their normal position? This last week we had a child with a marked anterior emphysema which seemed to be improved by leaving the needle in the chest for six or eight hours. It is possible that the improvement was spontaneous but we thought it was due to leaving the needle *in situ* for a time.

Dr. Henry F. Helmholz.—I had a case somewhat similar to Dr. Abt's first case. We thought we were dealing with a lobar pneumonia on the right side. Later symptoms of peritonitis appeared and we thought this was a pneumococcus peritonitis. The child died and at autopsy we found a focus in the gall-bladder with edema and hemorrhage and an appendicitis.

Dr. J. P. Crozer Griffith, Philadelphia.—I recall the case of a child that died without our having the remotest idea what the correct diagnosis was. At autopsy we found a perforated appendix. I would like to ask the members of this Society if they would trust the *x*-ray appearances in suspected pneumothorax? I have not had sufficient experience with this condition to come to a conclusion.

Dr. Abt.—In reply to Dr. Gerstenberg's question, I would say that I asked the house surgeon to put a needle into the child's chest, but I do not know how much relief was obtained. A surgeon was then called in and made an incision and he seemed to feel much encouraged, but the child died. As to the possibility of making a diagnosis with the *x*-ray in pneumothorax, the *x*-ray men say that there is no doubt that pneumothorax can be diagnosed by the regular contour and the decidedly black areas that show the air-containing pulmonary cavities.

HEREDITARY MULTIPLE EXOSTOSES.

Dr. David Murray Cowie, Ann Arbor, Mich.—Cases of so-called hereditary multiple exostoses are rare enough to warrant the publication of an ususually marked case. The patient a boy ten years of age came under my observation as a referred case from the University Hospital, where he had been operated on for double mastoid. The physical examination was negative except for the multiple outgrowths and irregular thickenings of most of the bones of the skeleton, many of which were plainly seen on casual observation. The involvement was quite definitely symmetrical. In the upper extremities the humerus, radius and metacarpal bones showed thickening and exostoses. The carpal bones showed no deformities, ossification being incomplete and retarded. The femur showed thickening of the neck with blunt outgrowth projecting forward and downward. There was thickening of the lower ends with marked spinous outgrowths projecting upward on the inner and outer aspects. The tibia shows many spines projecting downward about the head. Small spines are to be found projecting downward at the costochondral junction of all the ribs. The clavicles and scapulæ were involved in the process, and the large pelvic bones showed the same irregular outline seen in the scapulæ. The transverse processes of one of the lumbar vertebræ shows distinct change. No prominences could be felt on the head.

The father of this boy shows similar, larger, but not so numerous, skeletal changes as those of the son. Radiograms of the wrists, hands and knees were made. The lower ends of the radius and ulna are greatly thickened and distorted. The forearms are distinctly shorter than normal; the metacarpal bones are irregular in shape, occasionally thickened and in a few places show slight evidences of exostosis. The knees are greatly deformed. The bony changes are peculiar in that most of them are spur-like and the affection seems to have had comparatively little effect in hindering most of the bones from acquiring their normal length and size. None of the spurs show evidence of previous fracture.

Genetically, multiple exostoses are of two main varieties. Cartilaginous exostoses which are probably the most common and fibrous exostoses. Cartilaginous exostoses arise from the periosteum, marrow or epiphyseal cartilages and develop in much the same way as the long bones. Fibrous exostoses are those in which connective tissue develops from the periosteum without any proliferating cartilage cells. They are more commonly seen on the surfaces of flat bones, skull or scapulæ. Nothing definite is known of the cause of this peculiar skeletal anomaly. Heredity is a definite factor. In this group no definite infectious agent seems to be at work. Enough cases of hereditary multiple cartilaginous exostoses have been recorded to warrant considering the process a disease entity. In this case the Wassermann and tuberculin reactions were negative. The disease should not be confused with myositis ossificans not infrequently seen in children.

DISCUSSION.

Dr. Alfred F. Hess, New York.—I have recently seen cases very much like Dr. Cowie's. There were three children in one family, one child ten years, one six and one a little over two years. The boy of ten has very large enlargements, especially of the head of the humerus. The child of six has the process less developed and the child of two is just beginning to show involvement. In this instance the father had exostoses of the knees.

Does the literature show that this condition is hereditary in the male line as in hemophilia and color blindness?

I would like to ask what treatment Dr. Cowie would suggest and what he thinks of parathyroid. I would also like to know whether he thinks the disease has anything to do with calcium.

Dr. William W. Butterworth, New Orleans.—It is likely that a condition of this kind is not rare. I have seen two cases in the same family; the process affected the spinous processes but not the long bones. The French writers mention this condition and seem to be familiar with it. Many of the lower animals, especially the grey hound have long spinous processes, for additional attachment of tendons so as to provide for the additional attachments of muscles, a provision making for greater strength.

Dr. Cowie.—Among 220 recorded cases I found none going back further than the father. There is no treatment that has been systematically employed. The suggestion as to the thyroid is interesting, but I cannot say anything as to its value. I made calcium estimations of the blood but they did not show anything very particular. It will be noticed from the picture that these exostoses develop at the foot of the muscle or under the muscle. As to the heredity the literature seems to show that the disease is sometimes from the father and sometimes from the mother.

SARCOMA OF THE BRAIN SIMULATING HYDROCEPHALUS.

Dr. L. Emmett Holt.—This child was perfectly normal at birth, weighing 6 pounds 5 ounces. The parents were Russians, normal healthy people with no hereditary disease. The child was admitted to the hospital when seven weeks of age. The parents said they had noticed the beginning enlargement of the head when the child was two weeks old. At seven weeks the head measured 20½ inches in circumference and the chest 15 inches. The only symptoms the child presented was the enlargement of the head. There was no paralysis and no local symptoms. There was assymmetry and a prominence over the left frontal bone. The only symptoms were those of an ordinary hydrocephalus and hernia cerebri. The reflexes were increased and the temperature subnormal. At autopsy the right hemisphere of the brain was quite normal but the left was found to be the seat of a large sarcomatous growth. The unusual features of the case were the absence of symptoms other than those of hydrocephalus and the rapid growth of the tumor. I have never seen a similar growth in a child so early in life or one that grew with such extraordinary rapidity.

DISCUSSION.

Dr. Charles Gilmore Kerley.—I had a somewhat similar case in a child eight or nine months old. The child showed the symptoms of hydrocephalus and this was the diagnosis made. A neurologist and an oculist examined the child but could find nothing. The child was operated on for hydrocephalus and at operation a large sarcoma was found. The child was operated on a second time and died within twenty-four hours.

CHYLOTHORAX IN AN INFANT.

Dr. Godfrey R. Pisek, New York.—This patient was an Italian baby two months and one week old. There was nothing in the previous history to account for the condition. The baby had no illness until ten days previous when she had a convulsion. There were no other symptoms except rapid and difficult breathing, with no rise in temperature or cough. On the day seen by the speaker the baby had also refused to nurse and was cyanotic. Its bowels had become greenish yellow. Except for a distinct area of flatness over the right chest posteriorly with corresponding diminution of breath sounds and slight displacement of the heart the physical findings were negative. A pleural effusion was suspected. At aspiration 6 ounces of a milky fluid were withdrawn. The laboratory reported that the milky fluid was sterile, composed of fat and seroglobulins. It was apparently a true emulsion. No evidences of a causative factor could be demonstrated. For five days the child continued to improve when the hyperpnea returned and the child was again aspirated with marked relief. The blood examinations showed red blood corpuscles 6,350,000, white blood corpuscles 15,000, hemoglobin 70 per cent., polymorphonuclears 55 per cent., eosinophiles 3 per cent., large lymphocytes 5 per cent., small lymphocytes 36 per cent. The radiograph showed an effusion in the right thorax with some displacement of the heart and mediastinal contents to the left. There was partial collapse of the right lung. The baby was allowed to go home twenty-two days after its admission being then in good condition. It is at the present time in apparently good condition and gaining weight. The case is reported because of its rarity and from the standpoint of prognosis. In the literature it is necessary to distinguish between true and pseudo-chylo thorax. This is probably the youngest case on record, namely nine weeks.

The etiological factor here can be assumed only and attributed to the convulsive seizure, which may have changed the pressure of the duct and caused rupture. Cure can only be surmised and accounted for by a probable enlargement of the anastomosing lymph branches which connect the thoracic with the right lymphatic duct.

DISCUSSION.

DR. DEWITT H. SHERMAN, Buffalo.—In 1907 I reported the case of a boy who had a true chylothorax and I presented no sample of chylous effusion. In my case the first time we aspirated we drew off 840 c.c., the second time 260 c.c. and the third time 1200. After this the boy made a prompt recovery. At the first two aspirations we thought it best not to draw off too much, so we drew off enough to make the boy comfortable and then later allowed the fluid to run off more rapidly, removing 1200 c.c.

(To be Continued in October Number.)

AMERICAN MEDICAL ASSOCIATION.

Sixty-eighth Annual Session, Held in New York City, June 4–8, 1917.

SECTION ON DISEASES OF CHILDREN.

First Day, Wednesday, June 6, 1917.

The Chairman, DR. JULIUS P. SEDGWICK of Minneapolis, *in the Chair.*

CHAIRMAN'S ADDRESS.

Dr. J. P. SEDGWICK, Minneapolis, delivered this address on

THE INSTITUTION, REËSTABLISHMENT AND MAINTENANCE OF BREAST FEEDING.

THE persistent demand upon the breast is a most important and continually neglected factor in the establishment, maintenance, and reinstitution of natural or breast feeding. Much time has been given to the discussion of the problems of artificial feeding; the amount of time given to the discussion of breast feeding has been lamentably small. A resolution was passed at the Chicago Session that as much time be given to the discussion of breast feeding as to artificial feeding. Lack of information on this subject is the real cause of most unnecessary infant mortality. Stimulation of the breasts is important in establishing lactation. The premature infant is incapable of furnishing the physiologic sucking stimulation necessary to support hormones that must be set free before milk comes into the breast. Such infants should be put at the breast at first and both of the mother's breasts expressed regularly five or six times a day. The breast is grasped about 1 or 2 centimeters back of the areola and a milking motion is carried out toward the nipple. The mothers very soon gain dexterity in this process. No massage of the breast proper is allowed, as it is of little value and sometimes causes traumatic inflammatory reaction.

If the baby does not gain well at the breast the trouble is practically always with the babe or the quantity of milk, but not the quality of the milk. When the breast supply is low the amount of milk should be determined by a balanced scale, not by the spring scale.

The possibility of reëstablishing breast feeding at a later date by stimulation should be emphasized. In the maintenance of the supply of milk attention should be given to stimulation. The instances cited show that confidence and technical skill are necessary in such cases. We know enough from the physiological standpoint to save the breast milk for most babies that are now deprived of it.

DR. ISAAC A. ABT, Chicago, read a paper entitled

THE TECHNIC OF WET-NURSE MANAGEMENT IN INSTITUTIONS.

In choosing a wet nurse, both she and her baby should be examined for tuberculosis of the skin, bones, and glands. Both mother and baby should be given the Wassermann test. The secretions from the mother's vagina should be examined for gonorrhea. In determining the efficiency of the mother as a wet nurse one should take into consideration the weight and appearance of her own baby, and be sure that the baby she presents is her own baby. If the baby's nutrition is good and the bowel movements normal, the mother will then fulfill the requirements of a wet nurse. I place very little importance on the chemical examination of the breast milk because it varies so much during different periods of the day.

In managing our wet nurses in the hospital we require that they should do a certain amount of work each day and that each nurse should nurse her own baby. This supplies the natural stimulation to the breast. We supply the necessary stimulation by placing the babies at the breast and do not use breast pumps. The mother is given instruction in expressing the milk manually. She expresses it every four hours during the day and night and always under the supervision of a nurse. The breast milk is expressed into sterile bottles and used immediately after it is expressed. In our institution the breast milk is reserved for the desperately ill babies, especially for those having marasmus or pyloric stenosis. When too weak to take the bottle, these babies are fed a teaspoonful at a time and if it cannot be given in this way it is given by gavage.

The food of the wet nurse should be sufficient but not excessive and it should be such food as she is accustomed to eating in her own home. The idea that certain foods derange the mother's milk is probably fallacious, but she should receive good, wholesome food at regular intervals, and a glass of milk every four hours. Raw food is permitted and the mother is allowed to take as much fluid as satisfies her thirst but is not urged to take large quantities of fluid.

The personal hygiene of the wet nurses is very carefully supervised. They are required to be cleanly and to wear cotton dresses which can be washed. The mothers are allowed to have their own babies in the room with them at night but not in the same bed. They are allowed to take outdoor exercise; each nurse takes her own baby out during the afternoon, but they are not allowed to remain out after dark. On the whole these mothers seem very well satisfied with the institutional life.

Our experience is that menstruation has little effect on lactation and very little on the quantity of milk. There may be a slight disturbance at the menstrual period but it is insignificant. About 20 per cent. of the wet nurses have regular periods.

As to the length of time that a nurse can be employed, we have retained them as long as eighteen months. One nurse whose baby was eight months old not only nursed her own baby but produced 56 ounces of milk besides; she was giving about 39 ounces to her own baby.

DISCUSSION.

DR. FRITZ B. TALBOT, Boston.—I do not think too much attention can be given to this subject. Until recent years very few hospitals had enough wet nurses to provide milk for their babies. Every hospital should have at least two wet nurses. I want to emphasize what has been said about watching the wet nurses, for unless they are watched, it has been our experience, they will substitute water or cow's milk to bring up the amount of their milk. In the technic of caring for the mother's milk we did one other thing; we strained the milk through sterile gauze and then placed it in sterile bottles and put in a sterile stopper which is covered with sealing wax; this is a safeguard so that the milk cannot be tampered with. In one of the children's hospitals in Düsseldorf when they have more human milk than they need they freeze it and they find that it will then keep for a considerable time and that feeding this milk that has been frozen has no untoward effect. It is a mistake to think that a wet nurse is no longer good when her baby is more than a year old. It is perfectly safe to continue to use the wet nurse's milk after this time. We had one nurse whose baby was over a year old who gave a very large amount of milk. The Japanese nurse their children three and sometimes four years. One very important phase of the wet-nurse problem is the social side. It is most important to keep the baby with its mother because if they are separated the chances of the baby dying are very great. If we keep these babies with their mothers about 95 per cent. of them will live and thrive. Another point is, that the wet nurse usually secretes more milk if she has her baby with her.

DR. L. M. SILVER, New York.—I want to say a word about the advantage of wet nursing and also to emphasize what has been said about the length of time during which a wet nurse may be available. In the Hudson Bay region and in Labrador the women may often be seen nursing children three or four years of age.

DR. JACOB SOBEL, New York.—My interest in the wet-nurse problem is from the community standpoint rather than from that of the private practitioner. I am in control of fifty-five health stations in this city. The point that first presents itself is naturally the importance of breast nursing as the remedy par excellence in the control of inant fmortality. There has been a feeling on the part of some that the milk stations tend to discourage breast feeding, but this is a great mistake. We have been using the milk stations to teach the value of breast feeding and to increase the number of available wet nurses.

About 40 per cent. of the births in New York are in the hands of midwives and it is necessary for them to report all stillbirths. The representative of the Health Department then visits the home of the mother and if he finds that she would be suitable as a wet nurse he asks her if she would nurse an infant; in this way we have a larger number of wet nurses available than ever before. When the Health Department gets the report of a death of an infant under one year of age, the mother is visited and asked if she will nurse a baby. In New York there is a very neighborly feeling among foreigners, especially among the Italians and Jews, and it is not at all uncommon for a neighbor to be willing to nurse a baby for a mother who is unable to do so.

I would like to ask whether anyone has tried injections of breast milk as a galactagogue.

Dr. L. E. Chapell, Grand Rapids, Mich.—Dr. Chapin has been carrying on a campaign to get children out of institutions and back into homes. He has sounded the slogan "Back to the home." I hope the contribution of this Section will be "Back to the breast."

Dr. Fritz B. Talbot, Boston.—I do not think we have sufficiently emphasized that in the examination of the wet nurse we must be very careful to rule out tuberculosis, syphilis and any other contagious disease.

Dr. George Dow Scott, New York.—To anyone who has had a hospital experience in Europe the difference in the social status of the wet nurse in such cities as Vienna and Budapest and in this country is very different. The social position of the wet nurse is better in New York than in Boston and other American cities, probably owing to the larger foreign population. The fact that the social position of the wet nurse is better in European cities makes it easier to get them there than here. The difference is probably due to the fact that our moral standards here are higher.

Dr. Charles Herrman, New York.—Just how much does it cost to run this department of your hospital?

Dr. Owen H. Wilson, Nashville, Tenn.—We have been using wet nurses for over twenty years and find it quite easy to get them in our locality. We employ colored women and allow them to go home over night. They are paid $3 or $4 a week. We get the best nurses from among the colored women. I do not think the danger from syphilis is so great. We employed wet nurses twenty years ago when nothing was known of the Wassermann test. I do not believe that expressed milk will convey syphilis.

Dr. Summers, Salem, S. C.—In the clinics of Vienna and Berlin and in working with Finkelstein, I have seen nurses whose babies were over a year old whose milk both in quality and quantity was perfectly satisfactory. We had one wet nurse who gave regularly 57 ounces a day. One feature, however, I wish to call attention to and that is that late in the course of lactation the milk is usually high in protein and low in fat so that in order to give a sufficient caloric value the quantity of milk has to be increased.

Dr. Carl G. Leo-Wolf, Buffalo.—This very interesting paper should be brought to the attention of the obstetricians. They do not know anything about this subject.

Dr. J. P. Sedgwick, Minneapolis.—I think the baby belongs to the pediatrician as soon as the cord is tied.

Dr. F. S. Churchill, Chicago.—I would like to ask Dr. Abt what the mortality is in his wards since he has adopted this plan of furnishing breast milk and how it compares with that of three or five years ago.

Dr. Edgar J. Hueneklyns, Minneapolis.—We have been experimenting with methods of preserving milk and we find that by heating it with hydrogen peroxide we are able to preserve it for three weeks during the hot summer months. We have been able to keep the bacterial count at from 300,000 to 1,000,000. It seems to me that the best method to get fresh breast milk for infants would be to combine the children's and obstetrical services of hospitals.

Dr. L. E. Chapell, Grand Rapids.—In Grand Rapids one has to pay from $8 to $12 a week for a wet nurse.

Dr. Isaac Abt, Chicago.—There is a difference in employing a wet nurse in a hospital and in a private home. It is much easier for the nurse in the hospital where she is not nagged by a nervous family and this is the reason it is difficult to get nurses in private families. Certain members of the family are frequently too domineering, and they worry the nurse so that she cannot do her best.

As to breast milk as a galactagogue—about every thing under the sun has been used as a galactagogue, even placental extract. It seems to me the only galactagogue is stimulation of the breast and the best stimulant for the breast is the baby. So far as examining the wet nurses for syphilis and tuberculosis, that is so elementary that I did not wish to offend your intelligence by emphasizing it. In some instances where wet nurses have come into the dispensary we have boiled their milk until we have time to make a thorough examination to eliminate syphilis and other contagious diseases. A syphilitic woman may infect a baby from the breast if not from the milk. It should be emphasized that we should never take the mother for a wet nurse unless her baby comes with her.

As to what was said about the breast milk being high in proteins and low in fats during the later period of lactation and the caloric value being low—this condition of the breast milk is what we want for very sick babies.

What we want to do in the hospital is to reduce the infant mortality and we want the breast milk just to bridge over a short period, maybe a few weeks and we do not care whether the milk has a high caloric value or a high fat percentage.

Dr. Churchill has asked about the results. I cannot give figures, but I do know that frequently a baby is brought into the hospital in a marasmatic condition, with cold extremities and apparently on the verge of the hereafter, and if we begin feeding that baby a teaspoonful of breast milk that baby frequently recovers. I do not know the mortality but I know that without the breast milk very few of these babies would have recovered.

PROBLEMS CONNECTED WITH THE PRODUCTION AND COLLECTION OF HUMAN MILK.

Dr. B. Raymond Hoobler, Detroit.—We have developed a plan for the collection and distribution of human milk in connection with the largest obstetrical service in Detroit. The milk is collected in sterile retainers, the amount credited to the wet nurse producing it, and it is then placed in the refrigerator. The hospital admits, in addition to a large number of private patients, a certain number of unmarried pregnant women. After confinement these women are urged to remain in the hospital or to return two or three times daily to give their milk. While they stay in the hospital they assist with the work. A portion of the milk is fed to the hospital babies; it is also sold to private families at 25 cents an ounce and all that is not disposed of in this way is sold to the Babies' Hospital for 10 cents an ounce. The milk may be obtained at any hour of the day or night. It is never delivered to private families by the woman herself, but two deliveries daily are made. Under suitable conditions a wet nurse may, however, be sent to a private home. When this is done an examination of both families is made to be sure that syphilis is excluded.

Such a plan may be conducted in a small hospital by a joint committee from the board of trustees and the hospital staff. In larger institutions a joint board of pediatrists and social workers might operate. When the work assumes sufficiently large proportions a paid social worker may be put in charge of it.

An important factor in keeping the mother producing a plentiful milk supply is a proper diet. The dietary requirements may be summarized as follows: 1. The diet to be efficient must produce a sufficient quantity of milk containing nutrition adequate to cause an increase in the growth of the offspring without impairing the tissues of the mother. 2. Diets containing from 2600 to 2900 calories in twenty-four hours produced better results than those containing 3400 to 3700 calories. It is of no avail to overfeed in the hope of maintaining or increasing the milk supply. 3. Diets containing 2000 calories or less cannot protect the maternal tissues and at the same time produce sufficient milk. A nutritive ration of less than 1 to 6 gave the best results. 4. Animal protein is better than vegetable protein in the elaboration of milk. 5. Nut protein is as efficient as animal protein in the elaboration of milk. 6. The best form of animal protein to protect the maternal tissues and to increase milk production is cow's milk protein.

DISCUSSION.

Dr. Thomas S. Southworth, New York.—Dr. Sobel has spoken of the work that has been done in the instruction of mothers in connection with the milk stations. Personally, I believe that we should emphasize the importance of properly feeding the mothers, so that they will be able to nurse their babies. Many of the mothers are accustomed to getting large amounts of tea and it is difficult to get them to take cow's milk which is one of the best milk makers. We should strive to make it possible to have a good milk supply for the mothers of breast-fed babies as well as for artificially fed babies.

Dr. Lucas, San Francisco.—I want to thank Dr. Hoobler for bringing up this subject because it is a most vital one. One has the best opportunity of carrying out such a plan where there is a combination of the pediatric and obstetric services of a hospital. It would be interesting to study the differences in mothers that causes one mother to produce a sufficient amount of milk while another does not. The psychological factor that has such a great influence on the milk production as well as the food has scarcely been mentioned. This is a very important factor. In our ward service there are many mothers who have illegitimate children and these mothers may not have a very good milk supply; by follow-up service and social service work with these mothers we are often able to correct this.

Dr. Hoobler has spoken of conducting the work through a committee composed of the directors of the hospital and the medical staff. The medical profession is the one that seems to respond least to the demand of this kind of work. It is a hard thing to get medical men to take up the use of breast milk. We have attempted to have the same kind of a service as Dr. Hoobler has but find that it takes a great deal of money.

Dr. Herman Schwarz, New York.—We have been interested in getting and distributing breast milk. I have been surprised that we have had no great difficulty in doing this owing to the fact that we are fortunate in having a combination of the obstetrical and outpatient department. We have thirty or forty babies come every day. We know about these babies from before they are born until they are one year old. The Wassermann test has been made before the baby arrives. After the mothers are discharged from the maternity ward they come back and we have no difficulty in getting 30 or 40 ounces of breast milk in an afternoon. In the summer time it is simply pasteurized or sterilized just as we do cow's milk.

Now as to the length of time that a woman may be of service as a wet nurse, I do not think it is a good thing for a healthy woman to nurse a child twelve, fifteen or eighteen months. We have enough women in New York to get a sufficient supply of breast milk without this and I do not think it is fair to the woman.

So far as the diet is concerned whether you have a high protein or a low protein diet, we have by careful estimations of the various elements of the diet tried to find under what conditions efficiency is maintained. So long as a well balanced ration is employed and the milk nourishes the child properly it does not make so much difference about the chemical analysis.

Dr. Lawrence T. Royster, Norfolk, Va.—The psychology of the situation is very important. I want to bring out a point that is somewhat different from what we have been talking about. In any work of this nature education means so much. It is necessary to educate both the mothers and the doctors, and of the two it is more difficult to educate the doctors than the mothers. Through the Children's Bureau at Washington Miss Julia Lathrop has been doing much toward educating the mothers of the country so that they are beginning to demand of the doctors more careful supervision of their children. There is one other point. It is often not sufficiently emphasized that the mother should keep track of the baby's weight, yet if the baby is on the breast and does not gain rapidly the mother's psychological condition may become worse and the worse her mental worries the poorer the milk supply and she finally reasons that her milk does not agree with her baby. How many have ever seen an instance in which the mother's milk did not agree with her baby?

Many popular magazine articles serve their purpose admirably, but every one who writes on these subjects for popular magazines should be properly censored. One article written by a registered nurse is accompanied by a picture of a baby scales in the basket of which is lying a beautifully dressed baby. This is certainly very inappropriate. It would be more suitable to have a picture of a set of cheap balanced scales and an undressed baby.

DR. L. R. DEBUYS, New Orleans.—There is one point not sufficiently emphasized. We recognize the importance of scales in taking care of the child, and it seems to me we should use the scales for the mothers as well as for the babies. If the mother can maintain her own weight it will be a great assistance to us in our work.

DR. R. R. FERGUSON, Chicago.—A supply of breast milk unless used absolutely as a therapeutic measure is out of the reach of most people. Even at 80 cents a pint, the estimate of its cost by one of the speakers, it would cost from $30 to $40 a month. Another point is that a bacterial count of 100,000 should not be allowed in breast milk, as it is even more important that we should have cleanliness in mother's milk than it is in cow's milk; we should keep the bacterial count low enough so that the milk does not need to be boiled or pasteurized.

DR. T. C. MCCLEAVE, Oakland, Cal.—We are connected with a dairy that feeds its cattle so as to get the maximum supply of high grade milk. Dr. Hoobler has brought out a very important point and that was that hitherto the special thing was thought to be the amount of food that was given to the mother and to many mothers the everlasting eating was most annoying. They were surfeited with food to the point of being nauseated and they felt that they simply could not take any more milk. I think Dr. Hoobler's having laid down the exact limits as to the amount of food beyond which it is unnecessary to go is very important, and one which we will do well to utilize in those coming under our care. If we can get a good milk supply with 3000 or less calories this knowledge will be very useful in producing a better psychological condition.

DR. JACOB SOBEL, New York.—A price of 10 to 25 cents an ounce for breast milk would practically put it beyond the pale of the institutional children and they are the ones that need it most. The wealthy have many advantages. With money they can buy good nursing care and proper surroundings which will be of benefit to the child so that probably artificial feeding can be successfully carried out with the rich child. Some arrangement should be made whereby we might have a supply of breast milk for institutional babies. If some philanthropist will enable poor people to get a reasonable supply of good breast milk it would be a work that would bring very tangible results. With regard to weighing the babies, at the health stations records of the weight of the baby are kept and if the weight remains stationary it goes down in red ink and is regarded as a danger signal.

Dr. B. Raymond Hoobler, Detroit.—I said the milk was sold at prices ranging from 10 to 25 cents, but I wish to add that we give away a good deal and in this way we equalized matters. Some of the women get $15 a week when they go into a home. When the wet nurses are employed by wealthy people many give more money and where they are interested in this subject they are willing to give for the less fortunate. In this way many have given very freely.

THE USE OF LACTIC ACID BACILLI MILK.

Dr. H. M. McClanahan, Omaha, Neb.—There are very good reasons why sour milk should always be made from either pasteurized or certified milk.

The only change that occurs in the milk is the conversion of a certain amount of the milk sugar into lactic acid. The living bacillus vulgaris must be present in the milk.

The writer has been using lactic acid milk for the past seven years and the present paper deals with his personal experience. One lactic acid tablet of standard make is dissolved in a tablespoonful of water and stirred into 1 quart of milk in a clean glass jar or pitcher. This is placed in a vessel of warm water, covered with a clean cloth, and kept at room temperature for twenty-four hours. The warming of the milk hastens the growth of the bacilli. In twenty-four hours the milk should be distinctly sour. In using skimmed milk it has been my custom to pasteurize it before it is inoculated. If the sour milk is pasteurized the lactic acid bacilli are killed and we are giving nothing but lactic acid milk. If there is any value in the living bacilli that is lost by pasteurization.

The question has been asked whether the lactic acid bacilli reach the intestinal canal in a viable state. The weight of authority is that they do, but I have no proof from clinical experience. The assumption is that the lactic acid bacilli are antagonistic or inhibitive of the putrefactive bacilli in the intestinal canal. The writer believes that the proteins of lactic acid milk do not form the tough leathery curds in the infant's stomach as do the proteins of sweet milk.

Lactic acid milk is useful in two groups of cases: 1. In infants convalescing from intestinal infections, chiefly during the summer months. It frequently happens that with a return to a milk diet there is a relapse; the lactic acid milk bridges over this time. 2. Cases in which sour milk has been of benefit in both infants and children who have been badly fed and have chronic intestinal indigestion, or in those children recovering from some acute disease, as pneumonia, nephritis, typhoid fever, those having milk idiosyncrasy, or those having frequent attacks of vomiting. In seven years, thirty-five children have been fed upon sour milk. There have been some failures but some of the cases, in my opinion, could not have been restored to health without the use of this food. Some children refuse to take the sour milk through a bottle or the milk comes through with difficulty. One should make new openings in the nipple by means of a needle heated to white heat. If the sour milk cannot be administered by any other means it may be given by gavage until the child becomes accustomed to it. Lactic acid milk is a valuable method of infant feeding. Normal infants do not require it.

DISCUSSION.

Dr. J. P. Crozer Griffith, Philadelphia.—Of course lactic acid milk is very variable, depending upon whether it is made from whole milk or skimmed milk. There is some difference whether it is made from whole milk or from buttermilk. It has been said that one advantage of buttermilk is that the process of churning makes a difference in the way in which the casein coagulates, but though this point is undecided the value of lactic acid milk is not to be questioned. The question is whether a bacteriological factor or a chemical factor is responsible for the good results.

Dr. McClanahan, Omaha.—In looking through the literature there is no evidence whether the bacilli pass into a viable state into the intestines. When we give unpasteurized lactic acid milk we are giving the living bacteria, but what becomes of them is another question.

A FAMILIAL TENDENCY TO FAT INCAPACITY IN INFANCY AND CHILDHOOD.

Dr. Thomas S. Southworth, New York.—The occurrence in a certain number of babies of an inability to digest the usual dietetic amounts of the fat of cow's milk is to-day generally accepted. The reduction of the excessive fat and the use of mixtures made from whole milk, though often remedial do not serve in all cases to eliminate the difficulty, so the next step is to employ milk more or less skimmed in feeding infants whose digestive capacity has been seriously disturbed. This is not always a temporary incapacity which may be overcome by careful feeding, but is in some instances an inherent characteristic which must be recognized if the best results for the individual are to be attained in later infancy and childhood. It has long been recognized that certain adults cannot take cow's milk in any quantity without complaining of what they call constipation and biliousness. It has long been known that some of these adults can take skimmed milk or fat-free buttermilk without producing these symptoms.

If not a few older children are found who do better with little or no milk and whose histories reveal that they have suffered from infancy from disturbances evidently due to the fat of cow's milk, is it not a justifiable deduction that a certain number of infants who have shown fat incapacity cannot wisely be given much cow's milk as they grow into childhood. It is a mistake to try to get all such infants back to a full fat milk. More general success is to be attained by continuing to feed partially skimmed milk and to limit its amount in order that the sum total of fat, even in the skimmed milk, should not exceed the infant's capacity. Adhering to skimmed milk will make the progress of such children more normal and the skimmed milk which is a valuable food can be retained in the diet.

The recognition of a familial tendency and its mention in the title has been employed to focus attention upon successive instances of fat intolerance in the same family, as well as to suggest caution in giving the normal amounts of fats to infants subsequently born into such families.

DISCUSSION.

Dr. Louis C. Ager, Brooklyn.—I do not doubt that there are a few such instances as Dr. Southworth has mentioned, but I want to present a corollary in regard to having this side promulgated without a warning. It may be true that there is a small percentage of children who have a congenital inability to digest fats of cow's milk, but these children can be brought to normal in this respect if the problem is worked at carefully. Many parents if they learn that their children have difficulty in digesting fats become hard to manage. I know of three instances in which there has been the greatest difficulty in persuading the mother when another child came that she could safely try giving it some fat; she thinks there is danger in fats and does not want to feed the child any fat at all. A normal child will digest a proper amount of fats without difficulty.

Dr. Frank C. Neff, Kansas City, Mo.—Dr. Southworth has made a very valuable observation, although I believe we have to be very careful in saying whether we are dealing with a familiar tendency or whether we have just a fat indigestion due to unwise feeding. I think we make a mistake in thinking the incapacity is due to one element instead of to the food as a whole. I think that in order to say that we have a fat incapacity we must take into consideration the character of the stools.

Dr. Fritz B. Talbot, Boston.—In talking about fat incapacity in infants and children it is hard to say that the fat is the sole and only cause of digestive incapacity. The term fat indigestion is very loosely used. We should remember that indigestion is not necessarily due to this element. In the second place, many times cow's milk cannot be digested properly because the fat of the cow's milk cannot be digested whereas the fat of olive oil would be digested. In other instances again, children who cannot digest the fat of cow's milk in the milk can digest it in the form of butter. Mistakes in attributing indigestion to fat incapacity may be eliminated by examination of the stools. If there is no fat in the stools or only a microscopical amount we can be pretty sure we are not dealing with a condition in which fat is the basis of the trouble.

Dr. B. Raymond Hoobler, Detroit.—It seems to me we are on dangerous ground when we attempt to attribute fat incapacity to a familial tendency; it is much more apt to be due to the method of feeding. Probably the cook uses large amounts of butter and cream in preparing the food. I have known instances where two or three children in a family would show indigestion after the family went to its country home, where the children got larger amounts of butter and cream than they were accustomed to. As soon as I found the source of the trouble I was able to eliminate it. Frequently an indigestion of this kind is persistent and one cannot find the source of the trouble until he gets into the kitchen and then he will be able to find the real reason. I think this is often the cause of a fat indigestion running through a family rather than any inherent idiosyncrasy in the family.

Dr. David E. English, Summit, N. J.—Nothing has been said with reference to the differences in the fats of the milk of different kinds of cows. The Jersey cow gives a milk the fat globule of which is very hard and tough. Do you not think it makes a difference what kind of cow's milk is given? We have found that a mixture of 45 per cent. Holstein milk, 45 per cent. red cow's milk and 10 per cent. Guernsey gives a milk containing 4.18 per cent. fats. I wonder if Dr. Southworth has taken into consideration the breed of cow in studying this problem of fat indigestion.

Dr. Thomas S. Southworth, New York.—I may answer Dr. English's question by saying that I have studied fat disturbances by using considerable quantities of milk of Jersey, Guernsey and Alderney cows as well as milk having a lower fat content. It has seemed difficult to separate fat indigestion from a natural fat incapacity. Where we have a fat incapacity we get fat indigestion with normal amounts of fat. With reference to Dr. Ager's warning, I may say that this paper is directed not to the laity but to the medical profession. Where this tendency to fat incapacity is found in parents it is sometimes found in children to the extent that they are unable to digest even the fat of breast milk. If we can trace the history of many of those with a fat incapacity we will find that there was trouble in feeding them in infancy. There is no doubt that the fancy herds of well-to-do families are a factor in producing fat disturbances. I am reminded of one instance in which a very rich milk was used, which contained 11 per cent. fat. A child who was having trouble was getting this milk.

Dr. E. C. Fleischner and Dr. K. F. Myers presented a paper entitled.

OBSERVATIONS ON THE PRESENCE OF THE BACILLUS ABORTICUS IN CERTIFIED MILK.

The opinion has become prevalent that raw milk is never a safe milk, and this has resulted in recent years in the pasteurization of all milk that is not certified. The suggestion has been made that even certified milk is not a safe product. Most pediatrists are of the opinion that raw milk is of value during the first year of life and it has become necessary to prove that this is true. Through dairy hygiene and the tuberculin test the incidence of tuberculosis among milch cows has been reduced to a minimum; still even with semi-annual tests it seemed that it might be possible that a few tuberculous cows might remain in a herd. It was with the purpose of ascertaining whether this was true that our experiments were undertaken. We injected guinea-pigs with milk from certain herds. At the end of twelve weeks we found that instead of being infected with tuberculosis as we had expected the animals showed a general adenopathy, enlarged spleen, abscess of the liver, abscesses of the testicles in a few instances, and other lesions. In fact these guinea-pigs had abortal disease and not tuberculosis. Taking five different herds of cattle a large number of examinations were made which showed the absence of tuberculosis but the presence of *B. aborticus* in over 90 per cent. of the samples of milk tested. For all practical purposes it might be said that the *B. aborticus* was present in all certified milk in and about San Francisco. On the other hand, the tubercle bacilli were not present in sufficient number to give tuberculosis to guinea-pigs. The fact that tubercle bacilli were not found did not mean that it was unnecessary to pasteurize milk. However, it seemed that if the *B. aborticus* was present in the milk to the extent that they had found it, it scarcely seemed possible that it was pathogenic for children, especially since no lesions were found at autopsy. What this investigation has really shown is that it is time to study the certified milk problem from every angle in order to be absolutely certain of the effect of certified milk on infants.

DISCUSSION.

DR. J. P. SEDGWICK, Minneapolis.—I have been much interested in this subject and am pleased to see such a careful piece of work. Two years ago Dr. Larson and I presented a study from the standpoint of the complement deviation test with the blood of children and the *B. aborticus*. We found that there was no reaction in the new-born but we found the reaction in older children. There is something that goes over from the milk to the infants so that after they have taken milk for a time they give a positive test. We found that often as high as 40 per cent. of certain groups of children gave a positive reaction. We do not know anything about the pathogenicity of the *B. aborticus* but are working on this subject now. We must look into the milk problem and take into consideration the possibility of other pathogenic organisms besides the tubercle bacilli. We may come to the place where we will heat all milk, even the very best of it.

Dr. E. C. Fleischner, San Francisco.—I purposely did not refer to the literature on this subject. There have been some exceedingly interesting things done in connection with the study of the pathogenicity of the *B. aborticus*. Work has been done in this country and Dr. Sedgwick is a pioneer in this field. I would like to refer to the work of Coolidge and Huddleston who have published a number of articles which are most interesting. In the first place they have worked with adults, testing the blood of a large number of adults who were using milk high in *B. aborticus* and the *B. aborticus* antigens and they got positive fixation reactions. As long as they fed the people with *B. aborticus* milk they got the positive. When the *B. aborticus* milk was stopped the antibodies disappeared from the blood. Considerable work has been done in feeding guinea-pigs and young animals with *B. aborticus* milk which has led them to the conclusion that the reactions in the blood do not last a great length of time after the ingestion of the *B. aborticus* milk is stopped. They have found a new variety of the organism, a lipolytic variety which produces a very marked splitting of fats and a large amount of fatty acids. In the first place, I think we may conclude that the *B. aborticus* is present in our milk in a very much larger percentage than has ever been proven before; and in the second place, that tubercle bacilli are not present in certified milk in sufficient quantity or with sufficient frequency to make certified milk dangerous from the standpoint of bovine tuberculosis.

Dr. Clifford G. Grulee, Chicago, read a paper entitled

RUMINATION IN THE FIRST YEAR OF LIFE.

The author has collected from the literature reports of sixteen cases of rumination in the first year of life. This would indicate a certain rarity which his experience does not bear out. The condition has such definite characteristics that it can be easily diagnosed so that errors in diagnosis must be very few. Either these cases are extremely rare or the condition is much more frequent than supposed and the reason it is not recognized is because it has not been brought to the attention of pediatrists. The writer has occasion to know of six cases which he reports, one of these was on his own service and there have been five other cases on the same service during the last three years. The case reported is that of a seven months old child which vomited, and lost weight. It was fed for four and one-half months on the breast and then on Horlick's malted milk with condensed milk. During the summer the child had an attack of diarrhea with as many as fifteen movements a day. The child showed adenopathy, intestinal distention, and the liver was enlarged until it could be felt at the free border of the ribs. The child was put on albumin milk. The temperature showed a tendency to be subnormal. Rumination became severe and resulted in the expulsion of large amounts of food. In this case there was a spindle-shaped dilatation of the lower part of the esophagus. The cardia of the stomach was small, the fundus large, and there was absolutely no cardiac sphincter. The muscular pyloric sphincter was normal. This illustrates the severe type of cases, though lighter cases are found and one is cited as illustrative. The severe cases are exceedingly fatal, the mortality being almost 25 per cent. in all reported cases. The condition was very similar to that found in pylorospasm. I am inclined to regard the condition as an affection of the circular muscle groups in the upper respiratory tract, including the cardia and pylorus of the stomach, the primary condition being a pylorospasm of greater or lesser degree followed in point of time by a cardiac spasm.

In infants having this condition the stools, as a rule, are not very different from normal. The probable danger is in the loss of food; so much is lost that what remains is insufficient to support life.

Treatment has been along three lines. Bromides and other sedatives have been used and also cocaine and other local anesthetics, but these are not successful in most cases. The second plan had been to give a thick purée which is not easily brought up. Stopping up the nostrils has been tried and abandoned and also washing the stomach with the stomach tube has been given up. Treating the psychological condition of the child has been found beneficial. In one instance a nurse attracted the attention of the child immediately after it took food and kept it absolutely distracted, giving it no time to think of its food. This child recovered. The points to be emphasized are that rumination in infancy is more frequent than is supposed; the condition can be explained, and the treatment should be based upon psychology.

DISCUSSION.

Dr. Rood Taylor, Minneapolis.—In the Minneapolis Hospital we had a baby that was under treatment for several months. All methods of treatment were employed. All kinds of opiates and stomach washing were tried. Finally going on the theory that this was a reflex phenomenon we tried treating the child by interrupting the reflex. We simply tied the child's jaw. At the age of nine months this child was practically normal.

Dr. John Lovett Morse, Boston.—Dr. Taylor has just said what I was about to say. We had a very serious case and one which it seemed must end fatally unless it was stopped. We were able to stop it by giving thick gruel, but the baby got starch indigestion. Then we had a trained nurse who stayed constantly beside the child and held its jaw. We then thought to rig up a pad which was placed between the child's chin and chest and I feel very certain that the nurse tried to discourage that baby by talking with it and reasoning with it. I am inclined to think that rumination is a bad habit. I do not think the stomach is able to relax the cardia and that the best way to stop the rumination is by tying up the jaw, and not by changing the food.

Dr. Charles Gilmore Kerley, New York.—My experience with rumination has been very satisfactory. I have seen quite a number of mild cases and two severe ones. One of the latter died and one is still under treatment, an older child, about fourteen months of age. My scheme of treatment was to use a thick gruel but I had such an experience with the gruel in the child that died on that treatment that I hesitated to use it in a second case. In this case the people became tired and took the child to another physician who treated it by giving thick gruel and the child stopped vomiting and did well. I think like Dr. Morse that rumination is a bad habit. The child is not happy until its mouth is full and the cure of the condition is an educational affair.

Dr. I. H. Goldberger, New York.—I want to add one point in regard to the therapeutics of this condition. Dr. Bartlett has reported a case in "American Pediatrics" which was successfully treated with thick barley gruel and then a barley jelly. There are very favorable reports on this method of treatment.

Dr. Clifford G. Grulee, Chicago.—Very serious cases have responded to certain kinds of treatment; almost every one has a different mode of treatment, so that I am quite skeptical as to the value of these various methods. It seems to me peculiar to regard rumination as a habit spasm. There is such a small proportion of children that develop rumination that it would be very odd to consider it a habit. We call it a habit because we do not get at the mechanism of the habit. While it may be a habit affair, it may be explained on Freud's theory. I have tried to get at the mechanism; it does not begin as rumination but as vomiting of a light degree and it continues until it becomes more severe in degree and becomes a habit, but there is something more in the mechanism than simply habit. If it were a predisposition or a habit it would not be so rare.

Dr. Lawrence R. DeBuys and Dr. Adolph Henriques, New Orleans, read a paper entitled

(*To be Continued in October Number.*)

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN

Specific Diagnosis of Tuberculous Meningitis.—In five cases of tuberculous meningitis., M. Kasahara (*Amer. Jour. Dis. Child.*, 1917, xiii, 141) found the diagnosis of tuberculous meningitis by the intradural injection of tuberculin specific. Among specific reactions, the most conspicuous thing is an increase in the cell count of the cerebrospinal fluid, especially that of the red cells. Control intradural injections of tuberculin (from 0.01 to 0.001 mg.) in one case each of suppurative meningitis, epidemic cerebrospinal meningitis, and chronic hydrocephalus caused no change of the cells in the cerebrospinal fluid. The process is as follows: After taking out a certain quantity of cerebrospinal fluid by lumbar puncture for cytologic examination, an intradural injection of diluted tuberculin (Koch's old tuberculin) is made. After six, twelve or twenty-four hours cytologic examination is again made of the fluid, which is obtained by lumbar puncture, and a comparison is made of the cell count before and after the intradural injection. The dose of tuberculin injected into the spinal canal is from 0.01 to 0.002 mg., with which a satisfactory result can be obtained. In the preparation of the tuberculin it is well to dilute it with physiologic salt solution (from 0.5 to 1 c.c.)

Syphilitic Disease of the Thymus in Infants and Mode of Origin of Dubois Abscesses.—J. Oliver (*Amer. Jour. Dis. Child.* 1917, xiii, 158) reports the pathologic findings in a congenitally syphilitic infant in which cysts were present in the thymus. She says that syphilitic disease of the thymus in infants is manifested primarily by a degeneration of the lymphocytes and Hassall bodies, with a hypertrophy of the reticular epithelium and hyperregeneration of the concentric corpuscles. The process may give rise to the formation of cystic cavities by the dilatation and fusion of the degenerating Hassall bodies.

Coagulation of Cow's Milk in the Human Stomach.—J. Brennemann's (*Arch. Pediat.*, 1917, xxxiv, 81) usual method of procedure was as follows: Before breakfast the desired milk or milk modification was taken on an empty stomach; unless otherwise stated, the mixture was warmed to 95° to 100° F. and was swallowed within five minutes if it was a quart, and within two minutes if it was a pint. After the desired interval the stomach contents were returned in the manner above stated. In some of the experiments where this interval was long, and most of the whey had passed on, it was necessary to drink water so that the curds could be returned. At first a quart of the liquid was used for each experiment and later, only a pint, when it had been proven by repeated trials that there was no perceptible difference in the coagulation of the larger and smaller amounts. In every case certified milk was used, always as nearly as possible under the same conditions. After the stomach contents were returned they were carefully examined and described, and then formalin was added up to 10 per cent. of the total mixture. This hardened the curds in a few hours to an almost ivorylike hardness and permitted of their permanent preservation either dried or in the formalin solution. The subject was a young adult in perfect health with no stomach, intestinal or constitutional trouble, with no antipathy or idiosyncrasy to milk, and with a gastric juice that was normal. For comparative purposes a thirty-minute interval between ingestion and withdrawal was adopted. It was found that cow's milk coagulates in the human stomach within a few minutes. The small curds formed at first, increase in size, for about two hours, by coalescing with their neighbors, after which they decrease because of the peripheral digestive action of the gastric juice, *but are still* *present after five hours.* The curds of raw milk are very large and hard and those of boiled milk small and soft; those of pasteurized milk between these, but almost like those of raw milk, *i.e.*, *raw milk is a very solid food—boiled milk a semi-liquid food.* The less the fat in the milk the harder and larger the curd, the more the fat, the smaller and softer the curd. The greater the amount of fat the longer the stay in the stomach, and the slower the digestion. *Milk taken very slowly forms a larger curd than when taken rapidly.* The greater the dilution with water the finer, flakier and more porous the curd. Alkalies and sodium salts very greatly inhibit coagulation—even stop it completely if in sufficient amounts. Precoagulated milk, such as buttermilk, pegnin milk or eiweissmilch, show very little tendency to recoagulation. Dried and condensed milks, as a rule, form a minimum curd. Starchy decoctions, such as barley-water, have a very decided influence in lessening the size of the curd, much more so than simple watery dilution. Soluble carbohydrates, such as dextrins and sugars (milk, cane and malt) have apparently no appreciable influence on the curd.

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ORIGINAL COMMUNICATIONS.

A STUDY OF CHLOROFORM, ETHER AND NITROUS OXID-OXYGEN IN PREGNANCY AND LABOR.*

BY

C. HENRY DAVIS, M. D.,

Assistant Attending Obstetrician and Gynecologist, Presbyterian Hospital, Chicago.

Two years ago I made the broad statement before this Association that "with the nitrous oxid-oxygen analgesia we have eutocia without danger to mother or child." The use of nitrous oxid-oxygen in pregnancy and labor was then limited to the practice of a few obstetricians, and none of these had used it in more than a few hundred cases. To-day it is being used by scores of physicians. Ferguson has recently collected reports of more than 7000 deliveries under nitrous oxid-oxygen analgesia. The results obtained have varied materially, and a few obstetricians have returned to the use of chloroform or ether as being both more satisfactory and much less expensive. The obstetricians who have had the most trouble admit they have had no experience in the administration of nitrous oxid-oxygen, and have had to depend entirely on trained anesthetists who know nothing of obstetrical needs.

The recent literature shows many different opinions regarding the relative toxicity and efficiency of chloroform, ether and nitrous oxid-oxygen. Many valuable contributions have been made to the experimental and clinical studies of these anesthetics, but the work has been done under such different conditions that it is very difficult to correlate the results. During pregnancy the life and health of the fetus must be considered as well as that of the mother.

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* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

From the departments of Obstetrics and Gynecology at Rush Medical College, in affiliation with the University of Chicago, and the Presbyterian Hospital.

Believing that there is a real need for further experiments in the toxicity of inhalation anesthetics, the writer has made group studies of pregnant and nonpregnant guinea-pigs anesthetized with chloroform vapor, ether vapor, or nitrous oxid-oxygen gas. The details of these experiments were reported to the Chicago Gynecological Society, May 18, 1917. While it is recognized that they are not conclusive, the correlation of the experimental study and clinical observations seemed to justify the following conclusions:

1. The administration of chloroform, ether and nitrous oxid-oxygen to pregnant or nonpregnant guinea-pigs, if given over long periods and repeated on successive days, causes degenerative changes in the tissues. The changes found in the liver are the most constant. Those following the use of chloroform are the most severe.

2. If the degeneration is not sufficiently great to cause death, the animal gradually recovers from the effects of the anesthetic, but it seems probable that the results of the injury may persist for a considerable time.

3. With ether and nitrous oxid-oxygen the changes are chiefly those of cell asphyxiation, yet it is evident that the cells recover more slowly following ether than they do after nitrous oxid. The central necrosis following chloroform is very different from that seen in asphyxiation and more permanent.

4. The long continued use of these anesthetics must be considered dangerous to the fetus in utero. Chloroform and nitrous oxid anesthesia seem more dangerous to the fetus than ether. The continuous nitrous oxid-oxygen analgesia, while less dangerous than the anesthesia, should not be administered over long periods.

5. The marked fatty degeneration of the livers in all three of the young born after their mothers had only one hour of chloroform-oxygen anesthesia shows that pure oxygen does not remove the danger of chloroform.

6. The changes following the use of nitrous oxid being identical with those seen after ordinary asphyxiation, it seems fair to believe them due to long continued interference with cell oxidation.

7. There is no reason for believing that the intermittent use of four or six inhalations of nitrous oxid-oxygen at the beginning of the uterine contractions can be of any material danger to the fetus. The nitrous oxid absorbed has been largely eliminated by the end of

the contraction and normal metabolism is not disturbed during the interval.

8. Since it is evident that anesthesia during pregnancy may be a source of considerable danger to the fetus, it is believed that operations should be avoided, if possible, during this period. The fetus in utero and the new-born would appear to stand ether *anesthesia* better than chloroform or nitrous oxid-oxygen.

COMMENT.

Chloroform.—The dangers of chloroform in surgical work have been recognized for many years, but because of the failure to observe deaths during its ordinary use in obstetrics, it was long thought to be harmless during pregnancy. Experimental results show that even at this time it is more dangerous to the mother than ether or nitrous oxid-oxygen. Its apparent safety came from the use of only a small amount administered at intervals during labor. But while this undoubtedly lessens the danger of any anesthetic agent, it does not change its action on the tissues. Chloroform does more than asphyxiate the liver cells, as has been demonstrated by many controls with varying degrees of simple asphyxia. Graham has shown that partial asphyxia will in time cause fatty changes in the liver, but it will never cause a central necrosis such as is seen in chloroform poisoning.

No one will deny the value of giving a normal amount of oxygen during an anesthesia, but so long as the action of chloroform on the tissues is more than an asphyxia, the administration of pure oxygen cannot be expected to remove its dangers. This is borne out by the very fatty livers of the young born to the guinea-pigs after one hour of chloroform anesthesia with oxygen given in excess. The fact that very little fat was found in the livers of the mothers suggests that the young may be more susceptible to chloroform than are adults. It seems hardly possible that these fatty changes could have resulted entirely from interference with the oxygen supply during the hour of anesthesia. They are undoubtedly due for the most part to the direct injury of the fetal liver by the chloroform absorbed through the placenta.

Ether.—While ether and nitrous oxid apparently produce similar changes in the tissues, it is evident that those from ether are more permanent. This is probably due in part to the much greater time required for its elimination. The pink color of etherized patients compared with the slight pallor so generally seen during a nitrous oxid-oxygen anesthesia, suggests that the blood of the former contains the larger percentage of oxygen. However, if the ether enters more firmly into combination with the lipoid substances of the body it may well interfere to a great extent with cell metabolism, since many hours are required for its elimination. No one has been able to produce tissue changes with ether which are at all similar to those seen in chloroform poisoning, and there can be no doubt as to the truth of the clinical observation that ether is by far the safer anesthetic.

Nitrous Oxid-Oxygen.—Judging from the experimental work reported in the past, the writer, with most others, had assumed that when nitrous oxid is not given to the point of cyanosis there is no danger to either mother or fetus. The present study, however, convinces him that it is possible to kill the fetus in utero by the long continued administration of nitrous oxid-oxygen even when macroscopic evidence of asphyxia is not observed. Furthermore, this danger is not entirely eliminated by administering oxygen in the percentage found in normal air.

Several factors probably work together in causing the asphyxiation of the fetus in utero. It was demonstrated by Sir Humphrey Davy that nitrous oxid will displace air and oxygen from water. Buxton found that nitrous oxid can "actually oust oxygen from its absorption," and with great rapidity become associated with some of the blood constituents. Laboratory workers are agreed that the administration of any narcotic interferes with the normal cell metabolism. It is apparent, therefore, that when nitrous oxid has been administered for some time, the blood not only contains less than the normal percentage of oxygen, but the body cells are less able to utilize the oxygen in the blood. Hence, when we consider the more or less complicated method of furnishing oxygen to the fetus, it is perfectly logical to assume that the fetus will show greater evidence of asphyxia than the mother.

The dangers from nitrous oxid-oxygen without evident cyanosis result from the long continued interference with cell metabolism. Therefore, it is believed that with our intermittent use of a few inhalations of nitrous oxid-oxygen during the painful stage of labor there is the minimum of danger, since the gas is so quickly eliminated and normal metabolism is possible during the interval between contractions.

Graham believes that the various hemorrhagic diseases of the newborn are probably all expressions of an asphyxial process. "This conclusion was based on the following points: 1. The similarity of the anatomic and clinical findings to those known to be induced by lack of oxygen, namely, cyanosis, edema, fat infiltration, hemorrhages, etc. 2. The experimental production of the various disease pictures by subjecting pregnant animals to the influence of chloroform, a drug which is known to suppress oxidations. 3. The production likewise of similar conditions by direct asphyxiation of fetuses through ligation of blood-vessels to the uterus."

In every spontaneous labor there is some degree of fetal asphyxia. Most babies born spontaneously have some degree of icterus and a few suffer from the more severe asphyxial conditions as Winckel's disease or Buhl's disease. Does icterus and the various hemorrhagic conditions occur in babies delivered by primary Cesarean section? Dr. Webster states that he has never seen hemorrhagic diseases of the newborn following primary Cesarean section. Our hospital records are not sufficiently complete in this particular for a definite statement, but I can recall no case of severe icterus following primary Cesarean section.

Not infrequently the asphyxiation of spontaneous labor becomes dangerous, and the fetus may die unless the labor is promptly terminated. The use of pituitary solution at such a time is undoubtedly more dangerous than the prompt administration of an anesthetic and a delivery with low forceps. The writer has seen no more evidence of fetal asphyxia from the routine use of some analgesic to lessen the maternal suffering during the painful period of labor, than was observed when the anesthetic was used only at the end.

Dorothy Reed Mendenhall reports that in 1915 there were in the larger Wisconsin cities thirty-six stillbirths for every thousand live births, and of those born alive 32.7 per thousand died during the first week of life. Her figures are conservative for the infant loss in the United States. The infant mortality of England and Wales for 1915 was 110 per thousand births. Fetal asphyxia and birth injuries were undoubtedly responsible for many of these deaths. A careful histologic examination of the tissues in such cases will show evidence of asphyxiation in a large percentage.

The so-called crowing inspiration described by Ferguson as occurring after nitrous oxid-oxygen analgesia is an asphyxial sign and may be found when no anesthetic has been used. The suggestion of giving oxygen is good but every baby should be made to cry vigorously soon after birth. Babies that thoroughly expand their lungs by crying rarely get cyanotic later.

There are no statistics which would indicate that the proper use of chloroform, ether or nitrous oxid-oxygen during labor has increased the number of stillbirths or the number of infants dying during the first week of life. We know that mothers who have the pain relieved during labor show less evidence of shock and make a better convalescence. Since fear and suffering cause shock and thereby interfere with the maternal metabolism, it is not improbable that the better condition of the mother will more than balance the ordinary toxic effects of the anesthetic.

Most physicians will undoubtedly agree that if the method of relieving labor pain does not increase the danger to mother or fetus it should be employed. For the relief of pain, chloroform and nitrous oxid-oxygen have proved equally efficient, but the cumulative effects of chloroform and its tendency to stop uterine contractions make it a less desirable analgesic even though we did not have to consider the possibility of chloroform poisoning. Administering the essence or oil of orange with ether, modifies the odor, and by following the technic of the nitrous oxid-oxygen analgesia a considerable relief may be secured at a slight expense. For this purpose the writer has had an air intake placed in his gas-ether machine. Nitrous oxid-oxygen is the most expensive analgesic per hour of administration, but for the average patient it is the most efficient and by far the most pleasant.

In conclusion the writer would urge that obstetric patients as well as surgical be thought of as individuals. The analgesic or anesthetic should be chosen for the operation and the peculiar needs of the patient. Ether, unless contraindicated, is thought to be the inhalation anesthetic of choice for long operations during pregnancy or labor. Nitrous oxid-oxygen may be used for examinations and short operations.

There is no clinical evidence to indicate that the intermittent inhaling of chloroform in labor is as dangerous as when given for anesthesia, but in view of its greater toxicity, there seems to be no logical reason for its continued use.

When an analgesic is needed early in labor, the writer advises an opiate, either alone, or with chloral hydrate or scopolamin.

During the painful second stage of labor, ether for most patients is less satisfactory than nitrous oxid-oxygen but more desirable than chloroform. Nitrous oxid-oxygen in the hands of most obstetricians has proved itself the most valuable analgesic for labor. No treatment is a panacea, but by the adaptation of the analgesics to the needs of the patient great relief can be given in every case.

NITROUS-OXIDE ANALGESIA IN OBSTETRICS.

A STUDY OF 476 CASES.

BY

W. C. DANFORTH, B. S., M. D., F. A. C. S.,

Surgeon to Evanston Hospital,
Evanston, Ill.

EVER since the introduction of chloroform into obstetrical work by Sir James Simpson in the first half of the nineteenth century, the question of finding an efficient and safe means for ameliorating the pain of labor has been before the medical profession. For decades chloroform was the only satisfactory means for relieving pain and only in very recent years has it been displaced to a certain extent by other and safer drugs. In the hands of the great majority of general practitioners, chloroform still remains the anesthetic of choice. It, however, possesses the disadvantage of toxicity and its effect upon the parenchymatous organs of both mother and child have been proven by the experimental work of Graham and others.

Ether for several years has displaced chloroform, particularly in hospital work and in the hands of obstetricians as distinguished from general practitioners. Both chloroform and ether possess the disadvantage of diminishing the force and frequency of the pains. This makes it difficult to use either of them over protracted periods, although when chloroform was first introduced, anesthesia "*à la Reine*," the administration of small amounts of chloroform for several hours was tried. The danger, too, to the child as well as to the mother as well as the slowing up of the labor would be sufficient reason for not using the drug in this way.

In 1878, Klikowitch used nitrous-oxide gas in a series of cases in which he reported good results. His work, however, was not followed up by others. The method fell into disuse and we heard nothing of nitrous-oxide in obstetrics until the publication of the papers of Lynch and Webster. Following their work we began at the Evanston Maternity in March, 1915, to make use of nitrous-oxide and oxygen for the production of analgesia during labor. From that time until the first of February, 1917, this method was used in 476 cases. The time of administration varied from a few minutes up to seven hours. An accurate record was kept of all cases receiving analgesia in order that the effect of the drug upon the mother and child might be accurately estimated. A card file was provided in the obstetrical building and after the termination of each case, a card was filled out showing the length of labor, the effect upon the pain, that is, whether the pains were diminished in strength or not, the effect upon the maternal heart, the effect upon the fetal heart, the condition of the baby at birth, the character of analgesia, that is, whether or not the pains were relieved satisfactorily or unsatisfactorily and the character of the puerperium. Later a notation was made of the length of time the patient remained in the building.

Our technic was modeled at first upon that described by Lynch but as time went on and experience grew, the method of administration became more familiar and our technic finally came to be the result of our own experience. We at first made use of a small dental nose-piece, instructing the patient to breathe through the nose, keeping the mouth closed, and changed to a large face mask when at the termination of labor. The use of the dental mask we soon discontinued, finding that it was sometimes difficult to get the patient to keep the mouth closed and we found that analgesia could be more satisfactorily produced by the large mask. This also obviates the necessity of changing masks toward the end of the second stage.

The administration of gas is begun usually at the end of the first stage. In multiparæ it is often begun a little earlier than this, particularly and primarily if the pains are sufficiently severe to cause real suffering. The operator should keep one hand upon the fundus of the uterus in order that the oncoming pain may be felt at the earliest possible moment. One of the most essential things for the success of nitrous-oxide analgesia is that the administration of gas should be begun very early in the pains, if possible before the contraction is appreciable to the patient as pain. Our experience has shown us this many times and the failure to observe this rule will lead to indifferent success. In the administration of gas analgesia, when the gas is being administered by an interne or nurse who has had no previous experience with it, we have found that the importance of beginning administration very early in the contractions has been the hardest thing for them to appreciate. The patient is told to take deep and rapid breaths. The number of breaths varies in different individuals. Some will obtain a very satisfactory degree of relief from pain with three or four breaths while others will find it necessary to take eight or ten. In a few cases the administration of gas throughout the entire extent of pain is needed.

Cyanosis is to be avoided and is not necessary. Any tendency to blueness or drooping of the eyelids indicates that too much gas has been administered and that the patient is in danger of passing from the zone of analgesia into that of anesthesia. The admixture of oxygen may be varied in different cases. No hard and fast rule may be given as to the percentage of oxygen to use. We have tried various methods of admixture, in some cases giving nitrous-oxide alone for the first two or three breaths and then adding 5 per cent. to 10 per cent. oxygen, while in a considerable larger number we have used the gas alone, only adding oxygen if a little cyanosis appeared or if the patient happened to be one of those who required administration of gas clear through the pain. At the end of the pain if necessary, oxygen may be given for two or three breaths to rapidly freshen up the patient but we have found as experience grew in the administration of gas that this has not been so frequently necessary as at first. In some cases the patient will notice the oncoming contraction before it becomes noticeable to the operator. When this has been the case we have asked the patient to signify immediately the first warning of a contraction in order that gas might be started. As the termination of labor approaches, a little more gas is given with each pain and during the time of expulsion, the analgesia is deepened to surgical anesthesia for a very short time.

In cases in which violent and frequent expulsive pains render laceration imminent, control of the head difficult, and the relief of pain less easy, we have tried adding to the gas and oxygen, a little ether during actual delivery. This is done by opening a valve in the gas machine, allowing the gas to pass through a vessel containing ether. In this way, the pain may be slowed a trifle, relaxation of the perineal muscles favored, and more complete control of the head permitted so that delivery may be accomplished with the minimum of damage. Cases in which the addition of ether is used rarely have any recollection of the actual delivery. The addition of a small amount of ether for the last two or three pains has been done only during the latter part of this series of cases as at first we were attempting to use the gas through the entire course of every labor. While this has been successful in many cases there appeared to remain a certain number in which complete relief could not be gotten. The addition of a small amount of ether for two to four pains seems to accomplish the relief of pain and practically permits better control of the delivery in these cases. Ether given in this way and for a short time does not nauseate, and the patient wakes up almost as quickly as if gas and oxygen alone had been given.

A striking thing has been the manner in which patients who had been complaining of pain, perhaps screaming and in some instances, highly excitable, have become rapidly quiet upon the beginning of analgesia and have remained so till the termination of labor. Several times after manual dilatation in a case which was making slow progress with a poorly dilated cervix the patient has been allowed to continue in labor under analgesia till the head was upon the perineum when a low forceps might be done. In these cases with a partly exhausted and highly nervous or hysterical patient it would be difficult to induce the patient to continue without analgesia and such cases would require termination by high forceps with the accompanying danger of fetal death and laceration of maternal tissues.

For operative procedures, ether has almost always been used although in some cases a low forceps may be carried out very satisfactorily with the gas. For an extensive perineal repair gas has not been found to be highly satisfactory as it is difficult to secure entire relaxation, the patient tends to struggle and move upon the table, interfering greatly with operative manipulations.

It has been recommended in case the child is born cyanosed that the mother be allowed to inhale oxygen for a few breaths before tying off the cord. The child will almost immediately receive the oxygen and its color will promptly become better. From present experience I believe this to be a maneuver of considerable value.

Two hundred and one cases received the gas from periods varying from five minutes to one hour. Of these 182 could be characterized as satisfactory. Twenty-four were varyingly characterized as poor, fair or fairly satisfactory. One hundred and fifty-nine were given gas for periods varying from one to two hours. Of these 19 were not satisfactory, 140 being satisfactory. Seventy-nine cases were given gas from periods varying from two to three hours; of these, 14 were not satisfactory, the remainder, 65, being satisfactory. Twenty cases were given gas for periods from three to four hours. Of these 1 was not good, the remaining 19 being good. Five cases received gas for periods varying from four to five hours. These were all satisfactory. Two cases were given gas for periods varying from five to six hours, both of them being satisfactory. Three cases received gas for periods varying from six to seven hours. Of these 2 were satisfactory and 1 was not. Taking the total number of cases, we find that the percentage of unsatisfactory administrations is 7.5 per cent.

The condition of the babies at birth was carefully observed. Thirty-two babies were recorded as having been born "asphyxiated" to a greater or less degree. In some of these the notation indicates that the child was born in "fair" condition. All cases in which the condition of the baby was other than entirely good are included here. Upon looking up the records of these cases it was found that in twelve cases some reason for asphyxia existed other than anesthesia. In seven cases forceps operations had been done, in one case a breech extraction and one case was a threatened eclampsia with induction of labor. One child was born with a spina bifida of large size, involving the lumbar region, the tumor being the size of a small orange. This child lived only three days.

In one case there was a severe degree of toxemia of pregnancy, the blood pressure going up to 160 and the child when born weighed only 2½ pounds. The placenta in this case showed very extensive pathological alterations, only about one-third of the placental area was in a condition to functionate and the child's development *in utero* had evidently been stunted through deficient blood supply. The placenta from this case was shown before the Chicago Gynecological Society. One case was a premature labor. We have, therefore, twenty cases which may be regarded as showing more or less asphyxia.

Six babies were stillborn. In looking up the histories of these cases it was found that one was a premature labor at six months, heart tones being inaudible at the onset of labor. One was a hydrocephalus. One was a face presentation with the head not engaged which was delivered by podalic version followed by forceps on the aftercoming head. One was a craniotomy which was rendered necessary by a contracted pelvis. Two others were breech extractions. One of these followed a version which was done for a transverse presentation. In these six cases we find causes incident to the labor or delivery which are sufficient to explain the fetal death. No case of fetal death, therefore, has occurred in this series in which the death seemed fairly chargeable to the analgesia.

The question has been raised in a recent paper by Ferguson as to whether the use of nitrous oxide may cause hemorrhage of the new-born. During the time covered by this series there were a number of cases of hemorrhage of the new-born. They seemed to come in groups, there being a group of five in the fall of 1916 and four cases during the months of March and April, 1917. No explanation is offered for this appearance in groups.

Of the four cases which have appeared recently two were perfectly normal cases, one being a rapid delivery with only fifteen minutes of analgesia. The other two were both forceps deliveries and one of these children bled from a wound in the scalp caused by the forceps, from the bowel, nose and from the wound caused by a hypodermic needle.

There is no question that asphyxia by whatever means it may be produced will cause hemolysis. It may also be accepted as a fact that anesthesia to the point of unconsciousness must produce certain changes of cell structure and therefore the hemolysis may be looked upon as more likely after anesthesia.

In the maternity in which these cases were observed there have been no more cases of hemorrhage of the new-born since the adoption of gas than there were before. Production of asphyxia, unconsciousness or cyanosis during obstetrical analgesia is an error of technic. Cyanosis should never be permitted and is absolutely unnecessary if the gas be intelligently administered.

In the light of all information which is obtainable it seems safe to conclude that gas is no more likely to produce hemolysis or hemorrhage than any other anesthetic agent. The fact that any agent which may produce analgesia and anesthesia is able to produce structural cell changes indicates the necessity of following the technic laid down earlier in this paper, namely, that the administration of gas should begin at the very earliest moment of the pain and should be continued only for four or five inhalations. This requires close attention on the part of the one managing the gas and if carefully done it permits relief of pain to be obtained with a small amount of gas and reduces at least to an exceedingly small amount any danger of hemolysis.

Ferguson reviewed about 7000 cases occurring in the practices of some hundreds of physicians, the data as to these cases being obtained by a questionaire. His responses fell into two groups. The first group comprised a majority of men who had observed no ill effects upon babies. The second group stated that they had experienced various effects of an injurious nature in some of the babies. Some of these said that no ill effects were observed if the mother did not become cyanotic.

DeLee believes that the use of gas longer than three hours carries with it some danger of hemolysis. Carl Henry Davis has carried on animal experiments with ether, chloroform and nitrous oxide to compare toxicity. He finds that nitrous oxide given over a considerable period and repeated on successive days produces tissue changes identical with those due to asphyxia. There is some degree of asphyxia in the child in all deliveries depending, as Davis states, upon the duration of the labor, place of the cord, pressure on the head, etc.

Many babies dying in the first few days show evidences of asphyxia as well as acidosis. Davis does not believe that the agents used to relieve pain during delivery if administered properly increase infant mortality. At least there is little evidence, if any, to this effect. Admitting that the prolonged administration of gas may cause injury and admitting also that gas given to the point of cyanosis is injurious to the child, we are still well within the bounds of safety for both mother and child if it is used as intermittent analgesia without cyanosis for periods up to three hours. This period of time takes in the great majority of cases. The avoidance of cyanosis demands merely some care and intelligence in learning and applying technic. Neither of these factors therefore practically debar us from the use of gas in obstetrics.

Two cases in this series developed puerperal insanity. Both of these were primiparæ, one thirty-two and one thirty-five. One of these received gas for one and one-half hours and the other for thirty minutes. Both received 10 per cent. of oxygen with the nitrous oxide. One of these was a patient of a physician who comes but rarely to the hospital and could not be traced.

The subsequent course of the other was ascertained. She left the hospital on the tenth day having developed her neurosis about the third day. She was not violent, her mental aberration taking the form of a mild melancholia or sullenness which continued after she went home but cleared up in about a month and she has been well ever since. Her previous history was that she had always been neurotic, subject to fits of melancholia and sullenness, lasting sometimes several days, and that she occasionally had had periods during which she would manifest an extreme aversion for her husband. She would occasionally also become excitable upon slight provocation. There was no evidence of toxemia or infection in this case. This was the case which had had gas but thirty minutes. In view of the history I believe that we can fairly say that the analgesia had no part in the production of her mental disturbance.

One result which is of much value I feel should be mentioned. That is, the freedom from mental and physical exhaustion which these women have after having gone through labor with the gas analgesia. I have observed this personally many times and have had many mothers tell me that there was no comparison between their feelings after labor, the most painful portion which had been gone through under the influence of gas and those after previous labors in which they had little or no relief from pain. Many of the nurses who have had occasion to take care of the same patient in subsequent confinements with and without gas have remarked the same, being struck by the excellent mental and physical condition of their patients after undergoing labor from which a large part of the suffering had been removed. As has been said by Polak, "having pain is work and work exhausts," and if pain can be removed a large part of the inevitable exhaustion of labor disappears. This factor must have its effect upon subsequent convalescence and I find is by no means a fact to be ignored.

No exact statement is made as to the influence of the use of gas upon the frequency with which forceps have been used. This is because many of the cases in the Evanston Hospital Maternity are delivered by men who are not members of the regular attending staff, hence it is difficult to assume that the indications for their use would be exactly the same in the minds of these different individuals. While the bulk of the cases have been under the care of the various attendings, a sufficient number have been under the care of others which would make it difficult to arrive at a scientifically sound statement as to the exact necessity for the application of forceps. However, the analgesia in every case has been administered by the permanent staff of the hospital, that is, by graduate nurses on duty in the maternity building and who have to do with the administration of anesthesia constantly or by the internes on duty in that division. Hence the administration of analgesia is exactly the same in its technic whether the remainder of the case conforms to a given standard or not.

We may say in conclusion that our experience to date has been for the great part satisfactory. We would make, however, the following suggestions for those who wish to follow this method.

1. That analgesia be used for a period not to exceed three hours.

2. That the gas be not given uninterruptedly but that it be given at the beginning of each pain only.

3. That gas be started *immediately* at the onset of a pain. If the pain be allowed to get well under way before inhalation is started, good results cannot be obtained. This is a fact of great importance and its neglect will inevitably prejudice the results which are obtained.

4. Cyanosis must and can be avoided.

5. It requires some care and attention to become an efficient administrator of gas. My feeling that some experience in this tech-

nic is necessary for ideal results has become stronger as experience has grown.

6. If the baby is born cyanotic allow the mother to inhale pure oxygen for a few breaths before tying the cord.

1620 HINMAN AVENUE.

A STATISTICAL STUDY OF THE CAUSES OF ABORTION.

BY

G. D. ROYSTON, M. D.,

Instructor in Obstetrics, Washington University Medical School, Chief of Clinic in Obstetrics and Gynecology,

St. Louis, Mo.

THE falling birth rate and the increasing frequency of abortion have given cause for grave concern to thoughtful obstetricians and social economists even before the gigantic struggle in Europe decimated the peoples of the civilized world. Suggestions for improving conditions were made and discussions held, but the profession at large received all such appeals rather indifferently—an indifference which was primarily due to a lack of realization of the full extent of the evils of abortion. The frequency of abortion has been variously estimated between 15.4 per cent. of all pregnancies Franz(1), 19.2 per cent.; Malins(2), Taussig(3); 25 per cent.; while DeLee(4) states that almost half of the child-bearing women have had an abortion before the thirty-fifth year. So large are these percentages that they can no longer be passed over lightly by the general practitioner especially since Jacobs(5) states that 50 to 60 per cent. of all gynecologic patients date the onset of their illness from an abortion.

The principal cause for the indifference of the medical profession was the assumption that abortion, with the sole exception, perhaps, of criminal abortion, was something inevitable, but in the light of more recent knowledge, we have arrived at the conclusion that in the majority of cases abortion may be prevented. The necessary premise for successful prophylaxis is a thorough understanding of the underlying causes, and it is for this reason that I have attempted to study systematically the etiology of abortion in the patients who were admitted to the gynecologic service of the Washington University Dispensary. During the four and a half months of this investigation 563 patients were examined. Among these 563 a history of abortion was elicited in 178. Of these, 164 were subjected to detailed study. The term "abortion" as used in this paper requires a brief qualification; ordinarily it is limited to any interruption of pregnancy prior to viability (28th week). When the fetus is beyond this stage, though not yet at full term, premature labor is the word commonly used. I found, however, that many patients were too indefinite in their statements as to the period of gestation and for this reason I have dispensed with these distinctions. For the purpose of this article, I shall term "abortion" every instance of interrupted pregnancy irrespective of the phase of gestation, which resulted in the death of the fetus, and shall further include stillbirths at full term. Cases of therapeutic induction of labor with death of the child occurring during or shortly after birth are not included in this classification.

In all instances I personally wrote an exhaustive history of the case with particular reference to previous pregnancies and abortions. All cases were subjected to thorough pelvic examinations, frequently in ether narcosis, and, in many instances, to a general physical examination. Wassermann tests and a functional kidney test with phenolphthalein were carried out in every case.

The 164 patients selected had a grand total of 664 pregnancies, 348 of which ended in abortion.

TABLE I.—INDUCED ABORTIONS.

Total number of patients	Total number of pregnancies	Total number of abortions	Total number of induced abortions	Per cent. of induced abortions in this series	Per cent. of induced abortions to the total number of abortions	Induced by				
						Self	Physician	Midwife	Drugs	Therapeutic
White 47	196	95	71	74.7	20.4	25	20	20	4	2
Colored 4	29	23	13	56.5	3.4	5	0	0	8	0
Total 51 both races	225	118	84	71.1	23.8	30	20	20	12	2

Table I shows that criminal abortion was the most common factor in my series. Fifty-one out of 164 women confessed to an induced labor. Many of these women had the performance repeated a number of times. These 51 women had in all 220 pregnancies of which more than half, namely 118 (52.4 per cent.) resulted in abortion. Of these 118, 84 (71.1 per cent.) were frankly acknowledged to have been induced. The percentage of induced abortions (71.1) is probably much larger in reality, for many women withhold the desired information. Comparing the percentage of induced abortions with the abortions in my entire material I arrived at the figure 23.8 per cent. This coincides fairly closely with the estimate of Taussig(3) who believes that more than 25 per cent. of all abortions are criminally induced.

The table also shows the means by which the abortion was brought about. Introduction of catheters, crochet needles, etc., by the patients themselves are first in frequency. Physicians and midwives have an equal share in the nefarious practice by means of dilators, curets, catheters, and the like. The few colored women in my series pinned their faith on drugs. Two attributed their successes to the ingestion of blueing and starch or gunpowder and whiskey. One claimed that she had terminated six of her twelve pregnancies at will by moderate doses of quinine. These statements can hardly be accepted unreservedly. We know from Lewin, Bumm(6), DeLee(4), and others that there are no drugs capable of producing abortion in the normal woman unless the maternal organism be severely poisoned. It so happens that the ordinary oxytoxic drugs such as oil of tansy and pennyroyal had not been used by any of my patients. Moreover, the patients who had used drugs had also positive Wassermann reactions, deficient renal function, or local pathologic changes in the uterus, and these were in all likelihood the true causes of their abortions.

Table II shows the effect of induced abortions upon subsequent pregnancies. Only twenty (39.2 per cent.) produced living children after having had abortions induced. The economic loss as well as personal distress is shown by the local changes found in such patients. While certain local changes may be factors in interrupting pregnancy, more often they result from the abortion. The various local changes found are enumerated in the next table.

In Table III it is shown that only 10 out of 51 patients had normal genital organs; the remaining 41 were more or less permanently disabled, and this last percentage bears eloquent evidence of the baneful effects of criminal abortion whether due to personal interference or disastrous activity of physician or midwife.

As has been said above, criminal abortion is the most frequent form and prophylactic measures are most urgently needed, but the obstacles to the curtailment of this widespread evil are so numerous and the problems which are at the bottom of this practice are so complex that our personal prophylactic measures seem hopelessly inadequate.

The second largest group of cases of abortion comes under the heading of syphilis. That syphilis may be a prolific source of abortion has been well known to the profession but the possibility of

TABLE II.—EFFECT OF INDUCED ABORTION UPON PREGNANCY.

Induced by		Children born					
		Only *before* abortion	Only *after* abortion	Both before and after abortion	No children born either before or after abortion	Abortion first, then children, after that again abortion	Total with no child born following abortion
Self	15W	4	3	3	4	1	8
	2C	1	...	1	...	...	1
Physician	14W	6	2	2	4	...	10
	C	...	...	...	...	...	...
Midwife	12W	5	—	1	4	3	9
	C	...	...	...	...	...	...
Drugs	4W	1	1	1	...	1	1
	2C	...	...	1	1	...	1
Therapeutic	2W	1	1	...	...	...	1
	C	...	...	...	...	...	...
Total	51	18	7	9	13	5	31

TABLE III.—LOCAL CHANGES FOUND IN PATIENTS WITH INDUCED ABORTION.

Induced by		Cervix	Inflammatory changes in uterus	Displacement of uterus	Adnexa	Laceration of pelvic floor	Pelvic connective tissue	Tumor	Patients with local changes	
									Patients	Lesions
Self	17	1	1	5	4	1	2	1	14	15
Physician	14	1	2	1	3	...	...	1	8	8
Midwife	12	1	1	3	3	2	3	1	12	14
Drugs	6	...	2	4	...	...	...	...	6	6
Therapeutic	2	...	2	...	...	...	...	...	1	1
Total	51	3	8	13	10	3	5	3	41	44

latent syphilis has not been fully appreciated. The introduction of the Wassermann test has enabled us to recognize many cases as syphilis which previously would have escaped notice. We know from the investigations of Gellhorn and Ehrenfest(7), Judd(8), Commisky(9), Peterson(10), and others, that latent syphilis is much more prevalent in women than in men. Veeder and Jeans(11) state that in children a positive Wassermann reaction may be the only symptom of syphilis for many months or years, while 50 per cent. of McLester's(12) so-called neurasthenic patients were proven to be syphilitic. Yet so capable a serologist as Buhman(13) contends that "the diagnosis of syphilis cannot be made upon a weakly positive reaction without some clinical evidence of the disease." This statement must leave the obstetric-gynecologic patient out of consideration since such clinical evidence is found in less than one-half of the cases of undoubted syphilis according to Gaucher(14), Peterson(10), and others. The history of any previous abortion should at once put us on guard and induce us to insist upon a Wassermann test. Only then may we hope to discover the disease even though neither history nor clinical evidence point to the presence of syphilis. The appropriate therapeutic regimè instituted at once and carried out energetically, will in all probability enable us to prevent future abortions. The publication by Trinchese(15) a few years ago threatened to confuse the issue. Trinchese(15) claimed that syphilis interrupts pregnancy only after the first four months and that in cases where a syphilitic woman aborted prior to this date, other causes must be held responsible. I am not ready to subscribe to this dictum. The material from which Trinchese(15) drew his conclusions is much too small to be convincing. Moreover, it is not at all clear why the spirochete should remain dormant in the mother and infect the product of conception only in the latter half of gestation. Miller(16) states that most conceptions occurring in syphilitic women terminate in the first month. Gow(17) contends that abortion in syphilitic women is quite common about the third month and these views coincide with my own observation. As one example for many I cite the case of Mrs. F. (No. 20852); gravida viii; first pregnancy was a full-term instrumental delivery, baby died three hours later, then six spontaneous abortions, five of which occurred during the first three months of gestation. Examination revealed a chronic salpingo-oophoritis; Wassermann positive ++; phthalein output of 37 per cent.; urine negative for albumin, sugar, and formed elements. Patient was given no local treatment after the diagnosis was made, but received vigorous antisyphilitic treatment in the dermatological clinic. She became pregnant the following month, went to full-term and gave birth to an infant weighing 3725 grams. Both mother and child gave negative Wassermann reactions.

TABLE IV.—SYPHILIS.

Patient									Husband	
Total patients	Total pregnancies	Total abortions	History	Wassermann positive	Lesions alone	Lesions + history	Lesions + Wassermann positive	Total patients, history + Wassermann positive + lesions	History	Wassermann positive
W										
134	552	275	7	29	3	3	7	46	5	2
C										
30	112	73	2	17	. . .	2	5	5	3	
164	664	348	9	46	3	5	12	51	8	2

Table IV shows the frequency of syphilis in my series. Among my 164 cases, forty-six gave a positive Wassermann and five patients with definite histories gave negative reactions after having been treated. Three additional patients showed lesions of the disease, though with negative histories and negative Wassermann reactions. These latter three had taken no specific treatment and were possibly cases of latent syphilis. Excluding these three mentioned, fifty-one patients were undoubtedly syphilitic.

Only twelve of the fifty-one patients with syphilis gave a history, or showed any lesions, of the disease.

This means that between one-fourth and one-third of my entire material was syphilitic; it shows that 34 out of 46 (73.9 per cent.) had latent syphilis.

Table V shows the effect of syphilis upon the period of gestation. Among fifty-one patients, there were 186 pregnancies, 115 (61.8 per cent.) of which ended in abortion. In addition to these 115 abortions, fourteen pregnancies resulted in full-term infants who died during the first few days of life. Thus 60.4 per cent. of their total pregnancies did not produce a child that lived through the puerperium. Of the 115 abortions 71 (61.4 per cent.) occurred during the first three months, 26 (22.6 per cent.) from the fourth to the sixth months; while only 18 (15.6 per cent.) resulted after the sixth month. A history of malformations among the children was obtained in but three instances from the fifty-one patients classed as undoubtedly syphilitic. In connection with the effect of syphilis upon pregnancy, the statistics of Le Pileur(18) are particularly instructive. Le Pileur(18) examined 130 women, some of whom gave birth to children before their infection and others after their infection. Among these same women *before* syphilitic infection occurred, 3.8 per cent. aborted as compared with 78 per cent. *after* infection. Where 48.8 per cent. survivors were born *before*, only 5.2 per cent. survived *after* syphilitic infection.

TABLE V.—EFFECT OF SYPHILIS UPON GESTATION PERIOD.

Total patients	Total pregnancies	Total abortions	Per cent. of abortions to total pregnancies	Wassermann positive	1–3 months inclusive	4–6 months inclusive	7–10 months inclusive	Died shortly after birth	Total abortions and deaths during first few weeks of life
12	41	27	62.4	+	15	8	4	4	31
15	68	44	64.7	++	33	7	4	5	49
12	45	24	53.3	+++	13	4	7	4	28
7	16	10	62.5	++++	4	3	3	1	11
5	16	10	62.5	History +Lesions, Treated	6	4	...	...	10
51	186	115	61.8	....	71	26	18	14	120

The lesson which may be drawn from my modest statistics as well as from the extensive work done by others in the last few years may be summarized as follows: Abortions are caused by syphilis much more frequently than the medical public realizes. Any patient who gives a history of one or more previous abortions had best be considered a victim of syphilis until incontrovertible proof to the contrary is obtained. It is better to err on the side of too much caution. Never let yourself be deceived by appearances. To have recognized syphilis as the true cause of abortion in any given case and to institute the right kind of treatment in a systematic manner, means to confer a true blessing upon the victim of the disease and to forestall future abortions. This does not necessarily mean to imply that in a luetic woman syphilis alone must be held responsible for abortions. It is conceivable that retroflexion, for instance, in a syphilitic woman may bring on abortion where syphilis alone might have permitted the pregnancy to go to full term. Yet it is safe to say that even in such a case the complication of syphilis will intensify the abortion-producing action of other factors.

Just as syphilis, so may any other general disease of the mother produce an abortion provided it is severe enough to affect the fetus or the placenta through changes in the maternal circulation. This is true of chronic conditions such as severe heart disease, nephritis and tuberculosis, as well as of acute infections with streptococcus or pneumococcus (DeLee(19)) or typhoid bacillus (Williams(20)), Berkowitz(21), Lynch(22)). Even pyelitis may cause a premature delivery (Mayer(23)). Finally, in habitual abortion without any apparent cause a disturbance of the internal secretions should be considered (Lehmann(25)).

In the following table (VI) I have grouped the cases in which abortion was most likely due to extra-genital conditions. Of such there were 40 among the 164. This includes two cases of abortion probably due to typhoid fever.

TABLE VI.—EXTRA-GENITAL FACTORS.

									Husband	
		Anemia	Pyelitis and pyelonephritis	Nephritis	Cardiac involvement	Tuberculosis	Splanchnoptosis	Obesity	Tuberculosis	Lead poisoning
White	29	2	3	1	4	4	12	1	. . .	2
Colored	9	. . .	2	1	2	1	1	. . .	2	. . .
Total	38	2	5	2	6	5	13	1	2	2

Among the cases listed above attention is called to two instances of secondary anemia. In one of these the connection between the anemia and the death of the fetus seemed very clear. This patient was pregnant twenty-eight weeks and suffered a profuse hemorrhage following the enucleation of a suppurating Bartholinian cyst. During the operation the vestibular plexus was injured. The hemoglobin dropped from 63 to 40 per cent. and fetal movements were not felt after the hemorrhage. A macerated fetus was expelled about two weeks later. The pathological examination of the fetus revealed no evidence of syphilis nor other tangible cause. Anemia causes fetal death primarily by insufficient aeration of the fetal blood. In addition, renal insufficiency may play an important part; for, according to Rowntree and Geraghty(26), profuse hemorrhages or severe anemias may reduce the excreting power of the kidneys to one-eighth of the normal.

Of the two cases of chronic interstitial nephritis one aborted during all of her nine pregnancies between the second and the fifth months. In the second patient the most painstaking efforts at preventing abortion failed utterly. The phenolphthalein test was disappointing in this case, for though she had abundant casts and albumin, her phthalein output which was tested twice, was 86 per cent. and thus gave no indication of the patient's serious condition.

In two cases of abortion the only etiologic factor found was chronic lead poisoning in the husbands. Similar observations have been reported by others (DeLee(19)). In the thirteen cases of splanchnoptosis the connection between this condition and the abortion is not quite clear. Two of the thirteen cases had a subinvoluted and two a retroverted uterus. The case of obesity with abortions points to a derangement of the endocrinic system.

Mention has been made above to impairment of the kidney function from nephritis as a cause of abortion, but even aside from this serious kidney lesion there are many women who have some impairment of renal function which though it passes unnoticed under the ordinary demands of life, manifests itself under the added strain of pregnancy. Williams(20) lays great stress on recognizing such insufficiency of kidney function as early as possible, and we have in the method of Rowntree and Geraghty(26) an excellent means by which, with but few exceptions, even beginning stages may be diagnosed. I have used this method in all of my cases and can say that it gave satisfactory results long before a clinical picture of uterine hemorrhage, placental infarcts, albuminuria and casts had put in an appearance. An occasional exception to this rule has been mentioned above.

Table VII refers to renal function. Normal kidneys excrete 60 to 85 per cent. of phenolphthalein, any percentage below 60 indicates kidney disease. Among my patients 57.9 per cent. had a phthalein output of less than 60 per cent. This group consists of 95 patients who in all had 425 pregnancies; of these 221, equal to 52 per cent., resulted in abortion. One hundred and forty of these abortions occurred during the first three months, 46 between the fourth and sixth month and 35 after the sixth month of gestation. Williams(20) seems inclined to think that renal insufficiency is apt to interrupt pregnancy only in the latter half of gestation, but the figure quoted above indicates that deficiency of the kidneys may produce abortion at any time, even in the earlier stages of pregnancy.

TABLE VII.—RENAL FUNCTION.

						Gestation period			Phenolsulphthalein test			
Per cent. of phthalein excretion	Number of patients	Number of pregnancies	Number of abortions	Percentage of abortions to the total number of abortions	Abortions induced	1–3 months, inclusive	4–6 months, inclusive	7–10 months, inclusive	Died within a few days after birth	Wassermann positive	Per cent. of pregnancies ending in abortion	Nutrition poor
10–19	2	11	9	2.5	3	9	...	...	1	1	82.0	1
20–29	5	21	14	4.4	8	12	...	2	1	1	66.6	3
30–39	21	119	57	16.3+	13	35	15	7	3	6	47.8	9
40–49	28	104	54	15.5+	8	25	18	11	3	6	51.9	3
50–59	39	170	87	22.1	18	59	13	15	11	15	51.1	2
60–69	48	186	90	25.9+	27	66	14	10	13	9	48.3	6
70–79	17	42	29	8.6+	5	22	4	3	....	7	69.0	1
80–89	3	7	4	1.1+	2	3	1	...	1	1	57.0	...
90–100	1	4	4	1.0+	...	...	...	4	....	..	100	...
Total....	164	664	348	100 % Approx.	84	231	65	52	33	46	....	25

That the phthalein test may denote a threatened interruption of pregnancy is shown by the case of Mrs. B., a private patient not included in this series. This patient in her first pregnancy at the thirtieth week had active contractions, blood pressure 130–78; phthalein output of 40 per cent., no albumin or casts. Patient was kept in bed on an absolute milk diet for a week, when the phthalein output had increased to 50 per cent., blood pressure of 126–74; cessation of contractions after the second day treatment was instituted.

According to Smith(24) who based his conclusions upon the study of 6162 cases in the Lying-In Hospitals of London and Dublin, the bad state of nutrition of the mother at the time of labor greatly increases the percentage of still-births and premature births and contributes to the fetal mortality during the first few days of life.

"Poor nutrition" is too indefinite a term and more likely a cloak of another hidden etiologic factor. I have, therefore, studied my own cases who presented a marked state of debility from this point of view, and present the results in the following table (VIII).

As was to be expected "poor nutrition" proved to be a symptom, not a cause. The real etiology of the abortion was renal deficiency in sixteen of the cases, while syphilis, pulmonary and cardiac lesions followed in the order named. In two instances abortion was apparently caused by a psychic, not a physical, trauma, one following a street-car accident, the other an attack by a dog. In neither instance was there any evidence of physical injury.

TABLE VIII.—NUTRITION POOR

Number of patients	Number of pregnancies	Number of abortions	Number of abortions induced	Syphilis	Gonorrhea	Impaired			No cause found
						Heart	Lungs	Kidneys Pthalein output below 50 per cent.	
25	118	69	4	9	2	4	5	16	2

Many children are lost at birth largely through meddlesome interference; again owing to various maternal and fetal abnormalities, particularly those in which operative procedures are undertaken, etc.

It is quite common among the very prolific and much overworked women of the poorer classes, for overwork to be classed as the cause of abortion.

In my series, trauma was the apparent cause of death in nine of the eleven babies lost at delivery, four of these nine were breech presentations and five were forceps deliveries. Four of the nine patients were left with extensive cervical laceration. One case was a prolapsed cord and one a placenta previa.

Since a history of breech delivery was elicited in only five cases, of which four were stillborn, it behooves teachers of obstetrics to give more attention to this phase of the management of labor.

Of my six instances of abortion occurring after physical exertion, cross-country walks seemingly caused two, while hard housework including moving furniture and laundry work, was apparently responsible for the remaining four.

The injurious effects of local pelvic lesions in producing sterility and also in interrupting pregnancy is too well known to be more than mentioned. The consensus of opinion is that pelvic lesions, particularly those involving the endometrium, uterine displacement, fixations, etc., are powerful factors in causing abortion. Such changes may provide an unfavorable nesting place for the ovum, or may predispose to hemorrhage beneath the decidua basalis or, in still other instances, the indurated or sclerosed uterine wall does not sufficiently expand to meet the needs of the growing ovum, while adhesions may restrict the mobility and cramp the position necessary to a continuation of pregnancy. The local changes found in patients who have aborted may be either the cause or the result of the abortion. The following table (IX) shows the pelvic findings in my series.

TABLE IX

	Number of patients	Number of pregnancies	Number of abortions	Number of abortions induced	Wassermann positive	Renal deficit, less than 50 per cent. pthalein excretion	Constitutional or organic affection (heart, lungs, kidney)	Gestation period			
								1–3 months	4–6 months	7–10 months	Died first few days after birth
Normal genitalia nonpregnant	13	46	31	4	7	7	4	20	6	5	1
Local abnormality											
Tumor	15	48	30	6	8	6	5	19	8	3	1
Laceration pelvic floor	15	94	35	5	2	14	4	24	6	5	6
Uterine displacement	45	205	102	23	10	12	6	74	19	9	5
Cervix	10	49	24	4	2	2	1	16	4	3	3
Uterus	27	118	55	20	4	10	3	38	12	5	10
Adnexa	24	77	49	20	7	8	2	37	10	2	2
Pelvic connective tissue	21	77	39	11	6	8	4	18	14	7	2

Total of 108 different patients with local abnormalities.

Of the entire 164 patients, only 13 showed perfectly normal genitalia. One hundred and eight different patients exhibited 157 abnormal changes, the remaining 43 patients were obstetrical conditions as pregnancy, incomplete abortion, puerperal state, etc., in which the real condition of the genitalia could not be definitely determined.

CONCLUSIONS.

As a result of the study of these case reports, the following conclusions are drawn.

More than 20 per cent., probably over 25 per cent. of all abortions are induced.

Sixty per cent. of all induced abortions result in more or less permanent sterility.

Abortions induced by the midwife, the patient herself, and by the physician, rank in danger in the order named. Neither married state, church affiliations, nor the fear of ill-health will deter a woman once determined to interrupt her pregnancy.

A positive Wassermann reaction is obtainable in about 25 per cent. of all women who have aborted.

Less than one-third of the syphilitic women give any history or show any physical signs indicative of the disease.

Only by a routine Wassermann reaction can syphilis in the obstetric-gynecologic patient be detected.

Syphilis interrupts pregnancy at any and all periods of gestation.

Syphilitic women abort in more than 60 per cent. of their pregnancies.

A renal deficiency interrupts pregnancy only in the event of a renal decompensation which produces symptoms, as a rise in blood pressure, lassitude, headaches, insomnia or somnolence, vague discomfort, irritable uterus and a drop in the phthalein output.

These indications are that an interruption of pregnancy is impending and are often amenable to treatment.

Pregnancy may be interrupted as a result of renal deficiency at any period of gestation.

The phthalein test is of great value, though not an infallible index to the true renal condition.

Extragenital factors can produce abortion and must be investigated if subsequent pregnancies are to result in living children. Sixty-five to 90 per cent. of all women who have aborted will show some pathologic lesion in the genitalia.

A poor state of nutrition influencing an interruption of pregnancy is usually but a symptom of a more important underlying condition as syphilis, impairment of the heart, lungs or kidneys.

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A CASE OF DOUBLE OBLIQUELY CONTRACTED PELVIS (ROBERTS), ASSOCIATED WITH ACUTE LUMBAR LORDOSIS DUE TO INFANTILE PARALYSIS IN EARLY CHILDHOOD.*

BY

E. M. LAZARD, M. D., F. A. C. S.,

Attending Obstetrician Los Angeles County Hospital.

(With four illustrations.)

On the morning of March 5, 1917, the patient, Mrs. B., entered the Los Angeles County Hospital on my obstetric service. At the time of her entrance she had been in hard labor for seven hours. The following history was obtained:

Patient is a negress, aged thirty-nine years. Para-i, at term. She started to walk at about one year of age, and at six years of age met with an accident, having been run over by a horse. Since that time she has never been able to stand upright, and walks on all fours. Her crippled condition she attributes to this accident. She had been pregnant once before, but, owing to a fall, miscarried at five months. Her menses started at about twelve years of age, and are of the twenty-eight day type, lasting three to four days, and with the exception of two pregnancies, have never been interrupted, the last period beginning on the 20th of June, 1916.

She lies in bed with both thighs and legs flexed. It is impossible to straighten out the extremities to full extension. Measurement of her pelvis, which was done under considerable difficulty, both because of her crippled condition and because of the rapidly recurring labor pains, showed the following diameter:

Interspinous	23 cm.
Intercrystal	20 cm.
External conjugate	15 cm.
Right oblique	19 cm.
Left oblique	18 cm.
Diagonal conjugate	9.5 cm.

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* Read at a meeting of the Los Angeles Obstetric Society, April 10, 1917.

These measurements were confirmed at a subsequent examination after her recovery.

The linea iliopectinea were palpable by vaginal touch from the pubes around to the sacroiliac synchondrosis. With each uterine contraction, the fetal head rode over the symphysis pubis, and there was no attempt at engagement. It was very evident that we had an absolute indication for Cesarean section, both because of the highly contracted pelvis and because of the change in its inclination. This I did as soon as the necessary preparation could be made. A high incision entirely above the umbilicus was made, the uterus was incised *in situ*, and the baby was rapidly delivered. The uterus was then delivered partly out of the wound, when it was found that

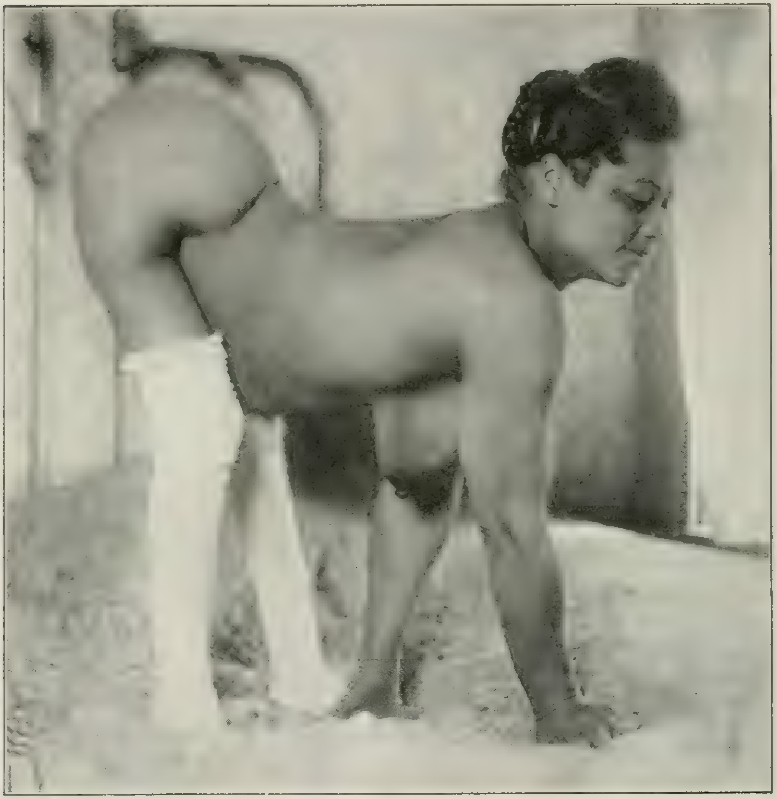

FIG. 1.—Showing patient on all fours. Note left hand grasping left foot, also marked muscular development of arms as compared with thighs.

there was a large fibroid on the left horn of the uterus, and a smaller one immediately adjacent to it. On the delivery of the uterus, much to my surprise, the Cesarean incision, which was immediately under the median line of the abdomen, retracted far behind the right abdominal wall. This was caused by the straightening out of a torsion of the uterus to the left, which had been caused by the large fibroid in the left horn. As I thought it would be a simple matter to remove these fibroids, I sewed up the Cesarean incision.

On delivering the uterus entirely out of the wound, I found it to be fairly studded with numerous fibroids of varying sizes, so a supravaginal hysterectomy was immediately performed. This necessitated lengthening the incision somewhat, but I was able to do it with the incision going down to the lower border of the umbilicus.

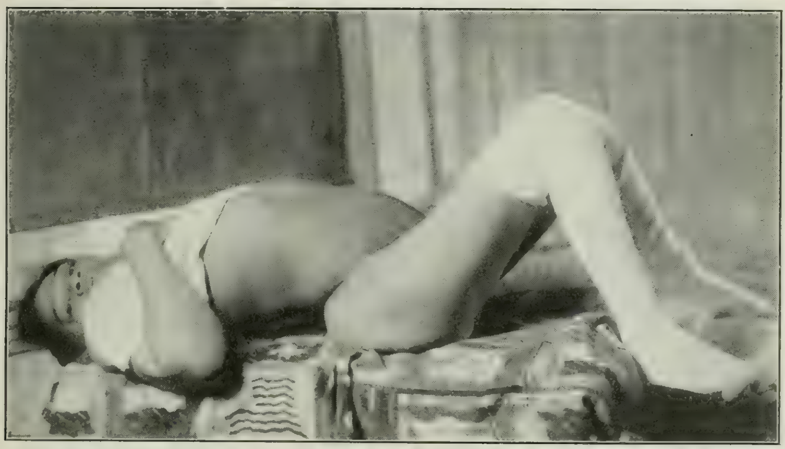

FIG. 2.

The abdomen was sewed up in the usual manner. The patient made an uncomplicated and rapid convalescence.

On making a more thorough examination of the patient after her recovery, it was found that although patient dated her crippled condition from the time of her injury, that probably was a mere coincidence, as by x-ray examination there was no traumatic condition of the bones found to account for her condition; but I discovered that she had a practically complete motor paralysis of the left thigh and leg, and partial paralysis of the muscles of the right thigh. On questioning her more closely, she stated that after the injury she suffered with what was called a spinal meningitis.

The accompanying picture shows the patient in her supine position. The amount of extension of both thighs as pictured is more than she can comfortably get, as her legs were being held at as great extension as it was possible, the flexed condition of the thighs and legs being due to contractures following the paralysis. The picture with the patient on all fours shows her standing in walking position.

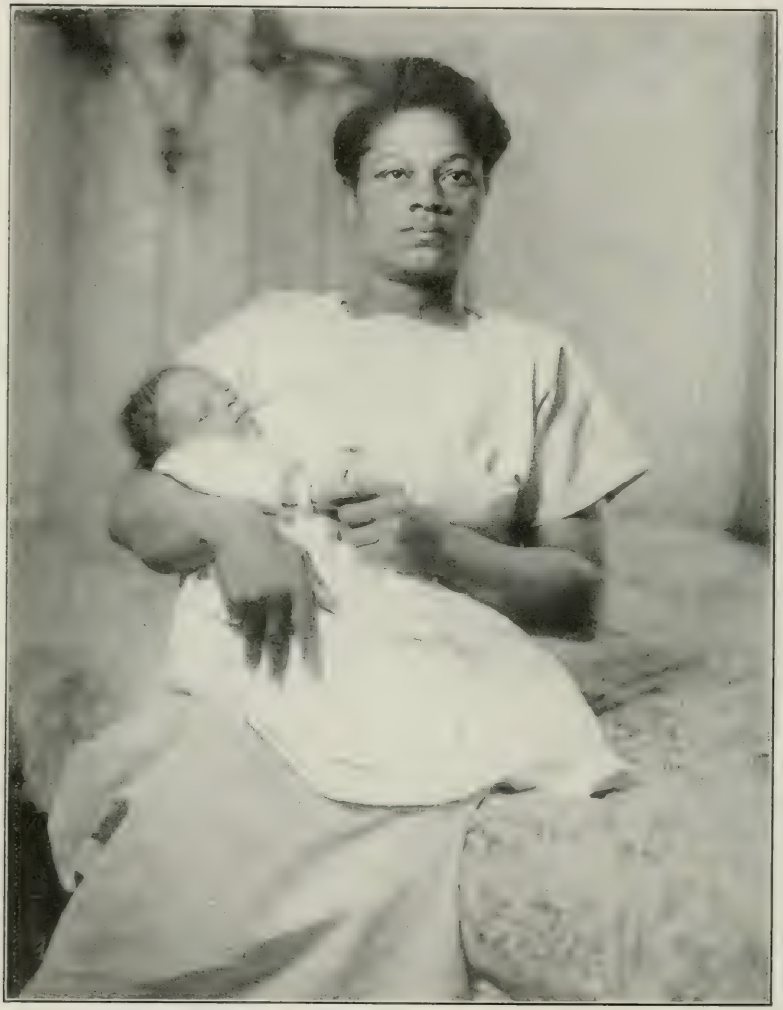

FIG. 3.—Patient with baby after delivery.

Note the left hand grasping the left foot. In walking the patient pulls the left lower extremity forward with her left hand. It is also interesting to note the great muscular development of the arms of the patient, as compared with that of the legs and thighs.

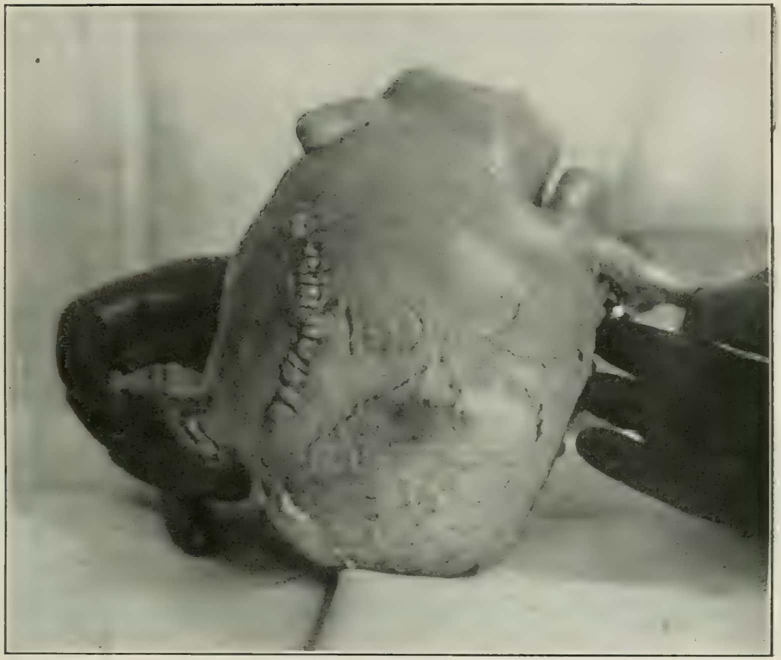

FIG. 4.—Anterior view of uterus, showing proximity of Cesarean incision to right border of uterus.

The anterior view of the uterus shows the Cesarean incision close to the right tube. This demonstrates the amount of torsion caused by the fibroid.

602 BROCKMAN BLDG.

DESCRIPTION OF A SIMPLE METHOD OF PERFORMING EXTRAPERITONEAL CESAREAN SECTION.

BY

THOS. H. CHERRY, M. D., F. A. C. S.,

New York City.

(With three illustrations.)

One of the greatest problems that the obstetrician has to deal with and in which his judgment is taxed to the utmost is the handling of obstetrical cases that have been in labor over a long period of time in which the membranes have been ruptured and attempts at delivery have previously been made. These types of cases are usually primipara, having relatively contracted pelves, and upon whom preliminary mensuration has been done by the attending physician and measurements found comparatively normal, but in whom there is an overgrowth of the fetus and the disproportion between the fetal head and the maternal head was such that delivery by instrumentation could not take place. It is in such cases as these where instrumentation has been attempted without success that the obstetrician is called upon to aid in the delivery.

Other types of cases are those in which there is an absolute contraction of the pelvis which has been unrecognized. The patients have been allowed to go into labor and continue into the second stage with membranes ruptured and prolonged hard bearing-down second-stage pains with no progress of the presenting part. In these instances instruments, as a rule, have been applied by the attending physician without success. On examination the fetal heart is strong but the patient is in a fair state of exhaustion in consequence of having been in labor for a considerable length of time. There is also a possibility of contamination of the birth canal. The physician is then confronted with two procedures: craniotomy upon the living child, or a Cesarean section.

A craniotomy upon the living child, obstetricians, as a rule, do not feel is justified. In performing a classical Cesarean section, the realization that various authorities give the maternal mortality from 16 per cent. to 20 per cent. under these conditions makes them pause before recommending such a procedure. In the first place, a woman under such circumstances, is a very poor operative risk for an abdominal section. Her vital resources, owing to the length of time she has been in labor and the taking of one or two anesthetics before coming into his hands, are reduced to a great extent. Furthermore, the contamination of the birth canal and the liquor amnii by the previous attempts at delivery, render the peritoneal cavity extremely liable for subsequent peritonitis. Owing to this high mortality rate of the classical Cesarean section in these conditions, various operative procedures have been devised to overcome the contamination of the peritoneal cavity by the infected material from the uterus. Extraperitoneal Cesarean section has become a popular mode of combating this chance of infection. It is not the intention of the writer to describe all the various methods of the extraperitoneal operation, but it will be interesting to know that of the various procedures we have at the present time, that the mortality rate in these infected obstetrical cases done by the extraperitoneal method has been reduced in the hands of different operators from 6½ per cent. to 11 per cent. With the decrease in maternal mortality pursuant to this method of delivery, it is only reasonable, that when such cases occur, the extraperitoneal route is the one of choice, rather than the classical.

The extraperitoneal Cesarean section can be done by two different methods: First, the true extraperitoneal route, where the peritoneal cavity is not opened. This was first described by Sellheim and later modified and perfected by Latzko. Second, the transperitoneal route in which the abdominal cavity is opened and the peritoneal surfaces, both visceral and parietal, are sutured together before the uterus is incised and the baby extracted. This method was first described by Veit. Numerous modifications have been made since that time, the most practical of which are those by Gellhorn and Hirst.

The method of Latzko consists in an incision from the umbilicus to the symphysis pubis, through the abdominal wall—including skin, fat, fascia, with separation of the recti muscles until the transversalis fascia and peritoneum are reached directly over the bladder. The bladder is then separated by blunt dissection from the anterior surface of the uterus until a sufficient space is uncovered extraperitoneally to allow for passage of the fetal head. The uterus is then incised in its lower segment, the fetal head is grasped with obstetrical forceps and the child extracted. The uterine wound is then closed by interrupted chromic sutures and a small drain is placed in the cellular tissue. This allows for a complete extraperitoneal exposure of the uterus and delivery is accomplished without soiling the peritoneum from any possibly infected material of the uterine cavity. The writer of this paper has performed this operation once in a successful manner. The main features of criticism are: First, there is a great amount of trauma attached to the separation of the bladder and the peritoneal covering of the uterus. This is easily done by blunt dissection with the fingers, and if the operator is fortunate in striking the proper cellular plane there is very little bleeding during the procedure. However, if one does not get into the proper fascial plane, blood-vessels which are thin-walled and of large size are torn and a great amount of objectionable bleeding takes place. Second, it is readily seen that with this great amount of separation and opening up of cellular spaces that lymphatic and blood-vessels are readily exposed to any infective material that is emptied from the uterine incision during extraction of the fetus. This raw area with its oozing of blood forms not only a fine culture medium for the bacteria present to propagate and produce an infection locally, but the lymphatic channels are exposed in such a manner as to readily carry infection to other parts of the body. Third, occasionally in separating the bladder from the lower uterine segment the lower end of the ureter is sometimes damaged so that a fistula may result. Fourth, the time consumed in performing this operation is considerably more than by the transperitoneal method.

The transperitoneal method has a great deal to recommend it. Gellhorn, by a transverse incision in the lower abdomen, opens the peritoneum and incises transversely the visceral peritoneum covering the uterus at the vesicouterine fold, pushes the bladder downward as in performing a hysterectomy, exposing the lower uterine segment. The parietal and visceral peritoneal edges are then sutured, so excluding the general peritoneal cavity, and the lower uterine segment is incised in the median line and the child extracted with the forceps.

Hirst's method consists in making a median abdominal incision from umbilicus to symphysis, opening the parietal peritoneum vertically, incising the visceral peritoneum covering the lower uterine segment in a vertical manner, separating the visceral peritoneum by blunt dissection so as to uncover a large raw area of the uterus. He then sutures the edges of the parietal and visceral peritoneum, excluding the general peritoneal cavity. The lower uterine segment is then incised in the median line and the child is extracted by forceps. The uterine wound is closed by interrupted sutures; the sutured peritoneal edges are then brought together and the wound closed in the usual manner. Dr. Hirst reports thirty operation done by this method upon contaminated cases with no maternal mortality. The writer of this paper has performed three trans-

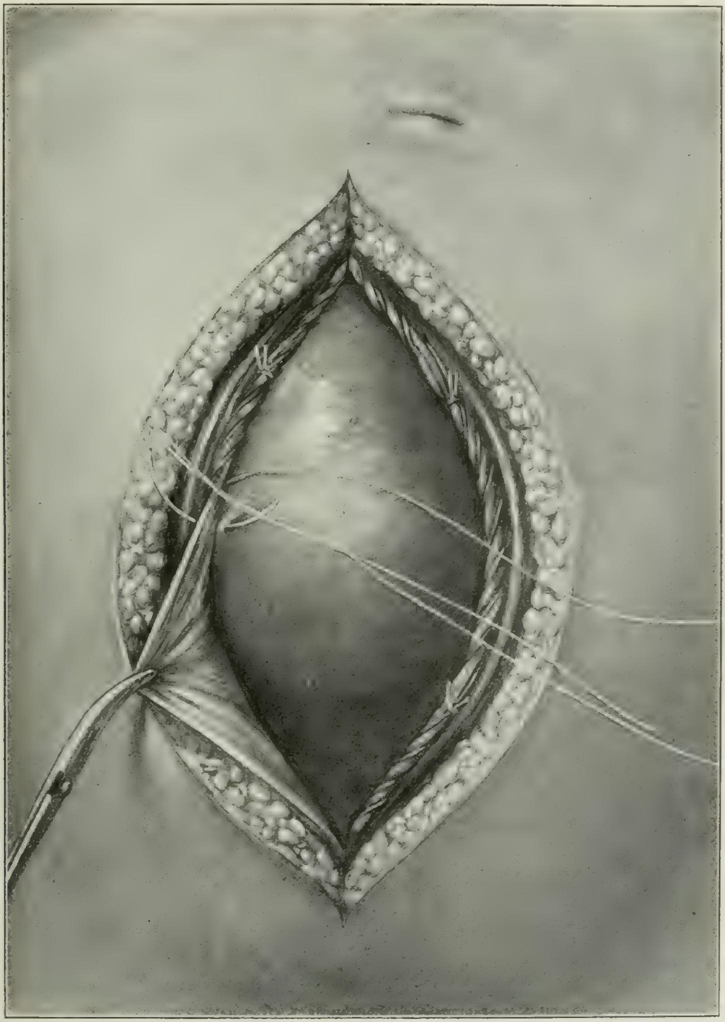

FIG. 1.—Showing incision through the abdominal parieties including parietal peritoneum. The cut peritoneal edges are being sutured by continuous catgut to the visceral covering of the lower uterine segment.

peritoneal sections by the Hirst method with no mortality rate, and has considered it a much simpler procedure than the true extraperitoneal Cesarean of Latzko. Some slight difficulty, however, may be encountered in stripping the visceral peritoneum from the uterus, and there are chances of buttonholing the peritoneum during this procedure as it is extremely thin and friable.

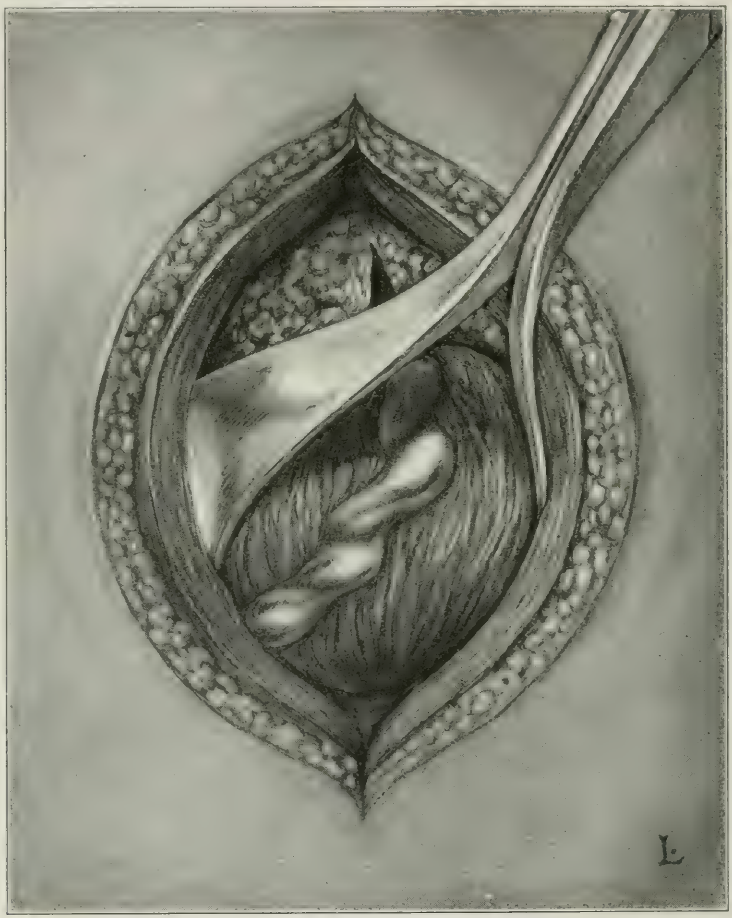

Fig. 2.—Showing incision into the lower uterine segment of uterus after exclusion of the general peritoneal cavity as in first illustration. Forceps applied to sides of fetal head preparatory to extraction of the fetus.

The following is a description of a procedure that is very similar to the Hirst method without a few technical difficulties therein encountered.

The patient is prepared as for any abdominal section, incision in the median line is made from the symphysis to the umbilicus through skin, fat and fascia of the recti. The muscles are separated by blunt dissection exposing the transversalis fascia and peritoneum.

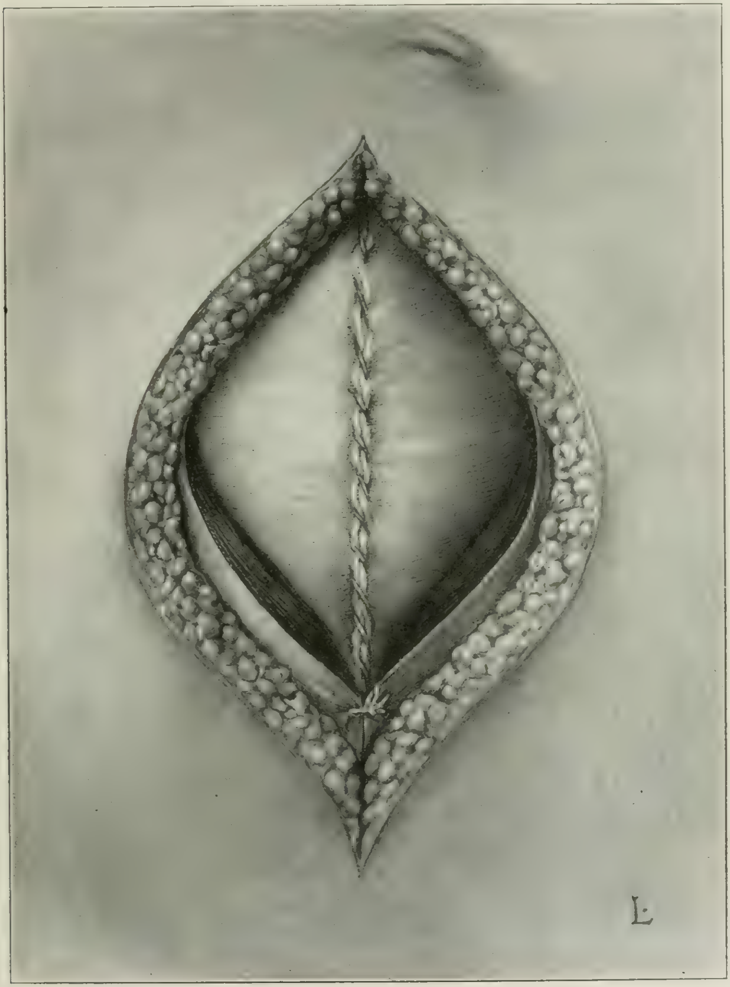

FIG. 3.—Illustrating the suture of the parietal peritoneum over oval area subsequent to closure of uterine incision by means of interrupted sutures and beginning closure of abdominal wound.

At this stage the edges of the muscle are bluntly dissected off the peritoneum for a slight distance until the deep epigastric vessels are seen which allows for freer play of the peritoneum. The peritoneum is opened vertically, and the cut edges of the parietal peritoneum are then sutured to the visceral peritoneum in such a manner that an oval area about 5 inches long and 3½ inches wide in the lower uterine segment is left exposed, care being taken to interrupt and tie this continuous suture at several points to prevent it acting as a purse string. This procedure shuts out the general peritoneal cavity. The thin lower uterine segment is then incised in the median line for 4½ inches and the blades of the obstetrical forceps are introduced to the sides of the fetal head, and the child extracted. The placenta and membranes are then delivered. One cubic centimeter of pituitrin is given intramuscularly at this stage followed immediately by 30 minims of ergotol. The uterine wound is then closed by interrupted chromic gut sutures; a continuous seromuscular suture is made over this line of sutures and the sutured edges of parietal and visceral peritoneum are sutured together. The rest of the wound is closed in the usual manner without drainage.

The above operation was performed by the writer upon a patient who was referred to him by Dr. Jos. Ramirez. The clinical history is as follows:

Mrs. G., para-i., age twenty-nine. Last menstrual period was August 15, 1916.

Physical examination showed heart and lungs normal; blood pressure, 100–82. Pelvic measurements: Interspinous 24 cm.; intercristal 26 cm., external conjugate 19.5 cm., diagonal conjugate 9.5 cm., transverse of outlet 9 cm. Estimated date of confinement, May 22, 1917. Considered a border line case of contracted inlet Special note made to watch and measure size of fetal head with possible induction of labor at or near term.

Course of pregnancy was uneventful, urinary findings and blood pressure being normal. On May 26, 1917, examination at term showed blood pressure 110–90; catheterized urine contained no albumin or casts. Fetometry by the Stone method showed that the occipito-frontal diameter measured between 11 and 11.25 cm. giving an estimated bi-parietal of 9 to 9.25 cm. The position was R. O. P. Head not engaged; fetal heart was 140, heard in left lower quadrant. Inasmuch as the fetal measurements corresponded to those of the pelvis it was deemed advisable to induce labor and if successful in this procedure it was thought that with good strong uterine contractions and with molding of the fetal head that a successful delivery would occur.

On May 29 the patient entered the Misericordia Hospital and induction of labor instituted. It was found necessary to give a general anesthesia with chloroform in order to instrumentally dilate the cervix to enable a No. 3 modified Champetier de Ribes bag to be inserted in the lower uterine segment. At this time the fetal measurements were again taken, and the occipito-frontal diameter was found to be between 11 and 11.25 cm. The conjugata vera of the maternal pelvis was estimated at 9.50 cm. The patient was put to bed and intermittent traction was made upon the stem of the bag. At the end of thirty-six hours no labor pains had been induced. The patient was very nervous, owing to the loss of sleep and was in a somewhat hysterical frame of mind. It was evident that a primary uterine inertia existed as there was no uterine contraction or dilatation of the cervix. We were then confronted with several possibilities: First, dilate a resistant and inelastic cervix sufficiently to allow the introduction of forceps and perform a prolonged high forceps operation, with resultant trauma to the maternal soft parts and prolonged pressure upon the fetal head with strong probabilities of delivering a still birth. Second, either dilating manually or instrumentally the cervix, or incising to obtain sufficient dilatation in order to perform a version and breech extraction; or thirdly, a Cesarean section. This last procedure was decided upon as being the best course to follow as there would be less trauma to the maternal soft parts, and the chances of obtaining a living child were excellent by this method.

It was decided to do an extraperitoneal procedure as there were some chances of contamination of the birth canal by the previous insertion of the bag. This was done as described above and a living child delivered.

It is interesting to know that the occipito-frontal diameter of the infant measured 11.50 cm. and the bi-parietal measured 10 cm., 1 cm. greater than had been estimated before delivery. This is the only instance that has come to the notice of the writer, and many measurements have been taken by this method first described by Stone, in which the bi-parietal has always been in the neighborhood of 2 cm. less than the occipito-frontal. Very seldom is there an error of more than 0.25 cm. Under these circumstances it was fortunate that a Cesarean section had been performed as delivery by the natural route would undoubtedly have been an extremely difficult procedure with almost certain death of fetus and with great amount of traumatism to the maternal soft structures.

The postoperative course was uneventful except for the fact that the patient developed a right sided pyelitis and a slight subcutaneous infection of the abdominal wound. This cleared up in the course of time. The patient left the hospital at the end of twenty-five days in good condition, the urine being entirely free from pus, but there still remained a small discharging sinus of the abdominal wound.

The technic described above is offered as a simplified method in performing an extraperitoneal Cesarean section by the transperitoneal route. As regards the results following such a procedure, it can be assumed that the maternal mortality is the same as for other transperitoneal methods adopted in contaminated cases.

Concerning the possibility of the sutured peritoneal surfaces acting as a suspensory ligament from the lower abdominal wall to the lower uterine segment, and theoretically at least producing a backward displacement of the fundus, it can be said that the same principle is involved in the Hirst technic—and he reports no such complication or end result in his series of thirty-one cases.

While the entire literature of the extraperitoneal Cesarean section has not been investigated, it cannot be said that the method above described has never been previously published. The writer is therefore offering this simple transperitoneal technic in hopes that it will be tried by other operators when indicated.

250 West Seventy-first Street.

A CASE OF CESAREAN SECTION IN A PRIMIPARA FOLLOWED IN THE NEXT PREGNANCY BY A NORMAL DELIVERY.

BY

FRANK WARNER, M. D., F. A. C. S.,

Columbus, Ohio.

The very circumstance that gives to Cesarean section a high mortality rate leaves a scar that is often inefficient to withstand the strain of a subsequent accouchement. Too often a Cesarean is performed only after other methods have been tried out in such a way as to have infected the uterine canal, then the abdominal delivery was done as a last resort operation, infection of the incision has followed, which gave a poor scar for any subsequent strain, if indeed the infection did not kill the patient. The high mortality and the poor scar, go hand in hand. Many times, there is no doubt, a careful study of the conditions preceding labor would have indicated at the start that an abdominal delivery was necessary, and this having been done as an early operation, the death rate for the mother and child would have been reduced and a much firmer scar would have been the result to approach a future vaginal delivery, if that were a possible thing.

Until rather recently, most writers and operators have followed in practice the adage, "once a Cesarean section always a Cesarean." But many observers are now taking quite a different view of the matter, although some able workers still advocate this well-known dictum. Newell(1), in a recent article, claims that once a Cesarean performed, it is safer for the mother to deliver by the same method in subsequent pregnancies. This is doubtlessly true when the Cesarean has been made on account of a pelvis which is much contracted, but where the pelvis is only slightly contracted, or not at all, it has been proven by a very considerable number of cases that in subsequent pregnancies the child may be delivered in the normal way without great risk of rupturing the scar at the time of the delivery, provided there has not been much infection of the wound during its healing; if there has been, then there is more danger of the scar giving way when the great strain of labor is put upon it.

When the wound is carefully and thoroughly sutured, and heals without infection, the danger of the scar giving way at a subsequent confinement is small provided the conformation of the pelvis is normal or nearly so. But even the most carefully sutured wounds and those which heal without infection, leave scars which occasionally give way. However, in nearly all the cases, this type of scar may be depended upon to withstand the strain put upon it during labor.

In some experimental work Mason(2) showed that, in animals, the muscular tissue gave way before the scar when weights were applied to the detached uterus. He also relates the histories of a number of cases occurring about Boston in the practice of different physicians, wherein normal deliveries have followed a previous Cesarean section. The high incision in the uterus is the one which gives the best results. In one of his collected cases, the obstetrician gave pituitrin, a thing few physicians would approve for a normal delivery in a woman with a Cesarean scar. It certainly adds to the risk of a rupture of the scar.

It does not require a Cesarean scar to make pituitrin a dangerous medicine, however valuable it may be under some circumstances. McNeile(3) reports a case of rupture of the uterus occurring during delivery where there had been no previous operation. So, if rupture will occur under these circumstances, one should be doubly on his guard in a confinement where a previous Cesarean had been made.

Findley(4) collected sixty-three cases of rupture of the uterus occuring in the scar of a previous Cesarean section. Davis(5) feels that a perfectly healed incision may be depended upon to withstand the pressure and strain put upon it during a subsequent accouchement.

All who have had occasion to analyze the cases of ruptured Cesarean scar, occurring in the attempt of a natural delivery find that infection at the time of the healing of the uterine incision is responsible for a weakened scar which gives way at the following confinement. It is in this class of cases, especially, that the majority of observers feel that a Cesarean is safer than to attempt an unaided delivery. But even this is not always true, for there are women who have had a Cesarean, with infection following in the wound, and a subsequent normal delivery. There is no doubt, however, that where fever has supervened after such a delivery, it would indicate that infection had taken place in the uterine incision, and that the scar left is less efficient to withstand the strain of a subsequent labor than where infection has not followed the operation. If infection has complicated the healing of the wound, it should be explained to the family that abdominal delivery will be safer in future pregnancies than vaginal. If the latter method is accepted, the patient should be placed in a hospital for the confinement, and the closest watchfulness exercised for any signs of the scar giving way. All preparations for an immediate operation should be made preceding this.

Where the wound has healed in an afebrile manner following a Cesarean section, and it has been carefully sutured, the scar may be depended upon, with few exceptions, to withstand the strain of future deliveries. But even in this class of cases, the same watchfulness, under similar conditions, should be exercised as in the preceding type of cases.

Transverse, fundal and extraperitoneal incisions did not give the scar less tendency to rupture, as shown by Findley's collected cases quoted by Davis(6). Not more than 2 per cent. of the collected cases showed a ruptured scar in subsequent pregnancies. He deprecates the use of a high forcep operation, tamponing, the use of bags or the giving of pituitrin where a Cesarean scar is in existence.

Rongy(7), in his study of the subject, found that rupture of the Cesarean scar occurred in about 3 per cent. of the cases, most of them took place during labor, some of them in the latter part of the pregnancy; that one-third of the patients who have been subsequently operated on by a Cesarean section showed evidence of previous infection which had left a weakened scar. His conclusion is that at least 75 per cent. of the women who had undergone a Cesarean, would require a section at the following pregnancy. This is not in accordance with my own studies.

While there are no positive signs which one may go by to determine whether a Cesarean should be repeated at a subsequent pregnancy, yet, as a general rule, when healing has occurred without fever or pus formation in the incision, a scar is formed which will probably withstand a normal delivery, especially if the wound has been sutured with care. Occasionally, however, scars of this type give way in labor or in the last weeks of pregnancy; though they are less inclined to rupture than the scar which has been formed in the face of infection. Both types of scar require watching during the last weeks of pregnancy and doubly so in confinement, and this watching should be done in a well-equipped hospital so that an immediate operation may be done if a rupture of the uterine wall occurs through this weakened Cesarean scar.

If the obstetrician proposes to try to carry a woman with a Cesarean scar through a normal labor, vaginal examinations should be assiduously avoided. The condition of the os should be determined through the rectum, as well as seeking whatever other information is desired; then if the woman is finally brought to section, infection has not been introduced into the uterine canal. The operation will carry a much smaller death rate and the resulting scar will have been formed in the absence of infection, consequently giving a much stronger incisional line with which to approach the next confinement.

At one time, Fritsch and others thought the transverse fundus incision would give a much stronger scar, but Offermann and Von Franque(8) have shown that this incision is even less trustworthy than the usual high incision of the perpendicular type, which is now adopted by most operators as the best.

The following case helps to illustrate the fact that "once a Cesarean always a Cesarean" is not always true:

On the twenty-first day of Dec., 1914, Mrs. D., aged 28, a primipara, began her confinement at full term. From the beginning of labor, the pains were complicated with hemorrhage. An examination revealed a placenta previa with a rigid and undilated os. The head was presenting, but feeling this was not a suitable case for the use of dilating bags and turning by the Braxton-Hicks method, as I have done in similar cases where the os was quite dilatable, a Cesarean section was advised and accepted. The operation was done a few hours after the confinement had begun, which was as soon as the patient could be transferred to the hospital and things made ready in the operating room. I made the usual high incision on the anterior surface of the uterus, delivered the child and tore away the placenta. The uterine hemorrhage ceased at once and there was no considerable loss of blood after that. The patient made a good recovery. Four rows of sutures were used in closing the wound in the uterus: one for the mucous membrane, one for the undersurface of the muscular structure and one for the upper layers, and one for the peritoneum covering the uterus. Care was used to go well up to the ends of the incision so as to leave no weak place there.

On the twentieth day of March, 1916, the patient gave birth to a full-term child without special incident; the scar having shown no tendency to give way, though her physician, Dr. Sullivan, of Dayton, Ohio, watched her very carefully for any signs of it. I am informed there was no tendency to its yielding to the strain put upon it.

Where once a Cesarean has been performed, no patient should be allowed to go into labor without the question has been thoroughly discussed as to the advisability of allowing the patient to try a natural delivery. If there has been severe infection following the operation, the probabilities are that the scar will be too weak to successfully withstand the strain of a labor; where the infection has been slight or not at all, the patient may be allowed to approach her confinement under careful and skilful supervision, provided there is no decided pelvic deformity, arrangements having been previously made to operate at the first evidence of the scar's giving way.

From a study of the subject, it seems preferable to operate promptly on cases of placenta previa in primipara with a rigid os, by doing a Cesarean. This is in the interest of both mother and child. Koenig(9) advises a Cesarean for all cases of placenta previa as safer for both mother and child; but the trend of American opinion seems to be more in favor of limiting the operation for primipara with a rigid and undilatable os; in other cases to depend upon dilating bags and podalic version. But even in primipara, where frequent or numerous vaginal examinations have been made, and the vagina tamponed, a Cesarean should not be done, but instead dilatation and podalic version.

Every surgeon is coming to understand that Cesarean section is made a much more dangerous operation when done after frequent vaginal examinations, and still more after the use of forceps in an attempt at delivery. If the patient survives the abdominal delivery, infection is more likely to complicate the healing of the wound, which gives a weaker scar to withstand subsequent labors; indeed, it is likely to compel the employment of a subsequent Cesarean if pregnancy again occurs.

Newell(10) emphasizes the importance of not accepting for Cesarean section cases that have been once fully tried out by operative procedures as unsuccessful forceps delivery, especially of the high type, but then to do a craniotomy or pubiotomy rather than a Cesarean. If it must be done under these circumstances, he believes it should be associated with hysterectomy at the time, as an infected uterus should not be permitted to remain after the Cesarean. Early in the confinement, he believes that the operative mortality of a Cesarean should be less than 1 per cent.

McPherson(11) objects to a Cesarean operation for breech presentation without other and more valid reasons, because of the mortality of the operation, which he gives as from 2 to 4 per cent. in the hands of the best operators, and the fact that a scar may be left that may necessitate an abdominal delivery at a subsequent time.

Delivery by the abdominal route is not more dangerous than other abdominal operations, provided the operation is undertaken very early in the labor, the earlier the better. If it is done as a last resort operation, it becomes not only a very formidable and dangerous operaton, but, if the patient survives it, a scar is more apt to be left that is entirely inadequate to withstand the strain put upon it at a subsequent labor. It is the late operation, after the parts have become infected, that has been more responsible than anything else for the high mortality upon the one hand and the inefficient scar to withstand the strain of a subsequent labor upon the other.

As far as possible, every case of pregnancy should be studied with reference to a Cesarean delivery. If it is determined that conditions are present which demand it, the operation should be done at the very beginning of labor; vaginal examinations being omitted at this time. Such a procedure will not only give a smaller death rate, but it will give a scar that is much stronger than where infection has entered.

When the operation is done under the most favorable conditions, there is always a slight risk of the scar giving way at a subsequent confinement. This fact should admonish one to avoid an abdominal delivery, when possible, for transient troubles, as eclampsia and placenta previa, though these are recognized indications for operative interference of this type in certain cases. But, if there has been extensive vaginal manipulation, and perhaps tamponing, it becomes a very grave matter to the mother to make an abdominal delivery, without, at the same time, making a hysterectomy.

CONCLUSIONS.

1. Cesarean section performed early in labor and before vaginal examinations or tamponing have been done, is an operation which is as safe as any ordinary abdominal operation.

2. When done after repeated vaginal examinations, and after the woman has been in labor for some time with the bag of waters

broken some hours previously, the operation is one of gravity to the mother.

3. When a labor has once been fully tried out, and forceps have been unsuccessfully used, craniotomy or podalic version are preferable to abdominal delivery.

4. If forced to deliver by the abdominal route late in labor after repeated and prolonged manipulations, as vaginal examinations, the use of forceps or tamponing, hysterectomy is safer for the mother.

5. A Cesarean incision that heals without infection, usually gives a scar that can be depended upon to withstand the strain of a subsequent labor, but not always.

6. A scar that forms after abdominal delivery in the presence of infection, gives a less trustworthy support for future deliveries than one formed in the absence of infection.

7. If a normal delivery is attempted in any woman who has had a previous Cesarean, it should be done in a hospital, the patient carefully watched for evidence of a yielding scar, with the operating room ready for instant service; rectal rather than vaginal examinations should be made in anticipation of a possible abdominal delivery.

8. Each case of pregnancy should receive a careful survey with reference to the possible necessity of an abdominal delivery, so that it can be done early in labor before the uterine canal has become infected.

9. A Cesarean should be avoided for temporary disturbances, as eclampsia and placenta previa, when it is possible to do so, though these are occasional indications for the operation.

10. In the case of a primipara, with a rigid os, complicated with placenta previa, an abdominal delivery is safer for the mother as well as child; in multipara, with a dilatable os, podalic version is efficient.

11. Breech presentation, simply as such, is not sufficient indication for a Cesarean section. The danger to the mother is increased and a scar is left that may cause complications in future deliveries.

10 WEST GOODALE STREET.

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PUERPERAL SEPTICEMIA.*

BY

WILMER KRUSEN, M. D.,

Director, Health Department,
Philadelphia, Pa.

Historical.—The acquisition of a definite knowledge of puerperal fever or puerperal infection is distinctly modern. Not more than twenty-five years have passed since we have acquired anything definite as to the etiology or treatment of this condition. The history of medical views on the subject of child-bed fever has been one long record of superstition, error and ignorance. Only by the painstaking study and research has the true cause of this condition become known.

From the earliest beginnings of medical literature until the nineteenth century the suppression of the lochia had been credited as the principal etiologic factor of this condition. This idea prevailed until about the year 1670, when Puzos advanced the idea that child-bed fever was due to a metastasis of milk which permeated the blood during pregnancy. He supposed that after delivery milk was attracted to the breasts, but it might, through some error of nature, gather in any part of the human anatomy causing serious and often dire results by this abnormal manifestation. Thus he reasoned that if the milk were drawn to the peritoneum there followed child-bed fever, and he even demonstrated the presence of milk at necropsy in the peritoneal cavity of these patients. There seems to have been no differentiation between septicemia and sapremia. Some authorities stated that puerperal fever was due to decomposing animal material. The first credit must be given to certain English writers who, during the first half of the nineteenth century, taught the infectiousness of puerperal fever. Possibly next credit is due to one of our American physicians (Dr. Oliver Wendell Holmes), who presented his publication on "The Contagions of Puerperal Fever" in year 1843. Following these closely there came the observations the of Semmelweiss of Vienna in 1846, and the publication of Sir James Simpson's paper on "The Analogy between Puerperal and Surgical Fevers" in 1850. These ideas were not without their opponents. Notably, two Philadelphians, who stood prominent among the specialists of that time, ridiculed the idea of the contagious or infectious character of puerperal sepsis. Not until, Semmelweiss had proven by his experiments with medical students who attended maternity cases that strict antisepsis was capable of reducing the mortality from 11.4 per cent. to a little more than 1 per cent. did the infection theory gain many adherents.

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* Read at a meeting of the Philadelphia Obstetrical Society, May 3, 1917.

The appalling number of women who lose their lives annually in our own country from child-bed fever has not decreased materially when we compare the year 1913 with 1900. In a bulletin recently issued by the Children's Bureau of the Department of Labor the rate for puerperal sepsis is compared with other preventable diseases. During the thirteen years before mentioned the typhoid rate has been reduced 50 per cent.; the mortality from diphtheria has been diminished more than this, but the rate for puerperal septicemia apparently remains stationary. For the year 1913 childbirth, with all its complications, caused more deaths among women of child-bearing period, that is from fifteen to forty-four years, than any disease excepting tuberculosis. Inasmuch as there has never been either for our own locality or for the United States Registration Area a "pregnancy index" established, we can, at the best, give only crude rates for deaths from puerperal conditions. With the coöperation of various hospitals the Division of Vital Statistics is endeavoring to obtain a record of the number of pregnant women who receive institutional care. By this means some approximation may be made as to the total number of pregnant women, and, in turn, this data will serve as a basis for a refined mortality rate of puerperal conditions.

Among fifteen of the more important foreign countries studied only two show a higher death rate from all puerperal conditions than that of the registration area of this country. Sweden, Norway and Italy, which are notably low, show what may be expected when the puerperal state is properly supervised. Improvement will come through a general appreciation of better care of the mother before the birth of the child, during the puerperium and subsequently. The problem varies in urban and rural districts. Of necessity better care should be afforded in the former district. If mothers demand better care physicians and midwives will provide it, medical colleges will enlarge the scope of their obstetric course, and provide better facilities for the training of their students. Prenatal care becomes an important factor both to the mother and the child. Postnatal care becomes more of a community problem, as the ultimate health of the community depends on the physical status of the individuals composing that community.

Etiology.—In seeking for the one factor on which to definitely place the blame for puerperal sepsis it became necessary to study the bacterial flora of the normal vagina as well as the pathological conditions affecting the genital tract. The pioneer in this field was Albert Döderlein of Leipsic, who published his first monograph in 1892. Prior to this time there had been demonstrated various bacilli and cocci in the vaginal secretions, but inasmuch as they were never satisfactorily grown outside the body, or those that were grown on artificial media were proved to be nonpathogenic, it had been concluded that the vaginal secretions contained no harmful bacteria. This was the result of various observers working independently about the same time. Döderlein examined some 195 women classing them according to clinical signs as normal or abnormal. He studied the physical properties of the secretions, as well as the bacterial content. In the normal group there was discovered no pathological organism except a fungus which was capable of producing superficial necrosis of skin when injected subdermally or subconjunctivally into the eye of an animal. This group constituted about 55 per cent. of the total number of cases.

In the abnormal group or pathological group studied, which constituted 45 per cent. of the cases, there was demonstrated a great variety of cocci and bacilli. The physical characteristics showed a wide variation. Various other clinicians, and laboratory workers followed out the same idea as proposed by Döderlein. Out of 542 women examined there were only twenty-seven cases in which dangerous streptococci were demonstrated.

During the early part of the nineteenth century child-bed fever was one of the greatest hospital scourges known. Because of its great opportunity for spreading the death rate was greater in hospitals and institutions than in private practice. The average death rate in hospitals in all countries was from 3 to 4 per cent. for all women confined, sometimes running 10 to 20 per cent. and often to 50 per cent. during short periods of epidemics(1). Many maternity hospitals were closed, commissions were appointed to investigate these epidemics, and medical and scientific bodies devoted whole sessions to the discussion of the problem. This was the time that

Holmes and Semmelweiss propounded their theory of infection. Previously Pasteur had discovered that living bacteria might be the cause of fermentation. Four years later, in 1867, Lister began to apply these principles to the prevention of wound infection. Disinfection and antisepsis were employed for all surgical procedure. In 1879 Pasteur proved definitely that puerperal septicemia was caused by bacteria.

Child-bed fever or puerperal septicemia is an infectious septicemia arising in connection with miscarriage or confinement, and, to a large extent, represents a preventable disease. The condition is analogous to wound infection following operation, and may be prevented by the same measures of asepsis which are universally employed in modern surgery. Since the application of this principle of asepsis the mortality has dropped enormously. Well-regulated hospitals now have a mortality from puerperal infection of less than 0.25 per cent., or about one maternal death to fifteen or twenty who died formerly(1). Experience has shown that by far the major part of all serious infections at childbirth may be prevented by the same principles of hygiene and strict surgical cleanliness as are now established in other branches of surgery.

Incident of Puerperal Septicemia.—In 1913 there was registered in the United States Registration Area 10,010 deaths due to conditions of child birth and pregnancy. Of this number 4542 or 45 per cent. were caused by puerperal septicemia. Using these figures as a possible number on which to base an estimate it is safe to assume that for the entire United States the mortality was approximately 7000 from septicemia. The crude death rate from all puerperal diseases for the year stated would be 15.8 per 100,000 population, or 7.2 from sepsis alone. This crude rate is based on the total population, both sexes, and for all age groups. Based on the female population, all ages, the rates for puerperal septicemia, as well as other conditions attending child birth will be found in the accompanying table.

The general opinion of the medical profession and of the laity is that deaths from puerperal septicemia are fast decreasing. Most obstetricians feel that, due to the decrease or practical elimination of hospital epidemics, the condition is now a thing of the past. On the other hand, many eminent specialists of wide experience believe that outside of hospitals there has been no great decrease in the totals or the rate. Williams of Johns Hopkins, Webster of Rush, Powell and De Lee and others feel that there has been no great improvement in this country. Unfortunately, available figures on this subject

TABLE I.

Year	Death rate per 100,000 female population from diseases caused by pregnancy and confinement			Year	Death rate per 100,000 female population from diseases caused by pregnancy and confinement		
	Total	Puerperal septicemia	All other		Total	Puerperal septicemia	All other
1900	26.9	11.6	15.3	1906	29.2	11.8	17.5
1901	26.7	11.1	15.6	1907	30.6	13.1	17.5
1902	25.5	10.6	14.9	1908	29.1	12.4	16.6
1903	26.6	11.0	15.5	1909	29.2	12.4	16.8
1904	30.3	13.2	17.1	1910	30.4	13.6	16.9
1905	29.8	13.0	16.8				

do not permit of intensive study. According to evidence available the death rates are apparently not decreasing. For the registration area as a whole the death rates show no decrease when comparing the years between 1890 and 1913. The annual average for the years 1901 to 1905 was 14.2; for the period 1906 to 1910, 15.5.

TABLE II.

Year[1]	Population of death-registration area		Deaths from diseases caused by pregnancy and confinement					
			Number			Rate per 100,000 population		
	Total	Per cent. of population of United States	Total	Puerperal septicemia	All other	Total	Puerperal septicemia	All other
1890[2]	19,659,440	31.4	3,011	[3]1,383	1,628	15.3	[3]7.0	8.3
1900[2]	28,807,269	37.9	3,772	[3]1,619	2,153	13.1	[3]5.6	7.5
1900	30,765,618	40.5	4,106	1,769	2,337	13.3	5.7	7.6
1901	31,370,952	40.3	4,294	1,882	2,412	13.7	6.0	7.7
1902	32,029,815	40.4	4,164	1,813	2,351	13.0	5.7	7.3
1903	32,701,083	40.4	4,569	1,992	2,577	14.0	6.1	7.9
1904	33,345,163	40.4	5,109	2,291	2,818	15.3	6.9	8.5
1905	34,052,201	40.4	5,077	2,309	2,768	14.9	6.8	8.1
1906	41,983,419	48.9	6,341	2,622	3,719	15.1	6.2	8.9
1907	43,016,990	49.2	6,719	2,908	3,811	15.6	6.8	8.9
1908	46,789,913	52.5	7,344	3,271	4,073	15.7	7.0	8.7
1909	50,870,518	56.1	7,791	3,427	4,364	15.3	6.7	8.6
1910	53,843,896	58.3	8,455	3,892	4,563	15.7	7.2	8.5
1911	59,275,977	63.1	9,456	4,376	5,080	16.0	7.4	8.6
1912	60,427,247	63.2	9,035	3,905	5,130	15.0	6.5	8.5
1913	63,298,718	65.1	10,010	4,542	5,468	15.8	7.2	8.6
Annual average								
1901 to 1905	32,699,843	....	4,643	2,057	2,586	14.2	6.3	7.9
1906 to 1910	47,300,947	....	7,330	3,224	4,106	15.5	6.8	8.7

[1] Calender year, unless otherwise specified.

[2] Census year ending May 31.

[3] Figures for puerperal septicemia for the census years 1890 and 1900 not comparable with those for later years. See p. 41.

So far as local conditions are concerned puerperal septicemia shows a steady increase. This may be due, in part, to better registration of our mortality. Each year the figures give us more accurate information of the number of cases and death rates, therefore, a comparison with figures for years gone by is likely to cause greater source of error. On general principles the later data is of more value than that of former years. Local conditions are compared for three quadrennial periods with rates based on the census returns for the years 1890, 1900 and 1910.

TABLE III.

	Nativity	Years				Total	Rate per 100,000 Population
		1890	1891	1892	1893		
1st Quadrennial....	United States....	30	28	29	33	120	11.05
	Foreign..........	25	16	14	20	75	6.91
	Unknown.......	..	2	..	3	5	0.46
		1900	1901	1902	1903		
2d Quadrennial....	United States....	27	38	27	23	115	8.63
	Foreign..........	23	10	8	17	58	4.35
	Unknown.......	..	..	..	..	...	.....
		1910	1911	1912	1913		
3d Quadrennial....	United States....	80	87	66	86	319	20.02
	Foreign..........	65	39	23	56	183	11.48
	Unknown.......	1	..	1	..	2	0.126
	People of color...	5	6	5	7	23	1.44

Rates based on average population for quadrennial periods.

This brings us to a discussion of the question of comparative death rates from childbirth in urban and rural districts. Unfortunately, the changing classification of the Bureau of Census in grouping urban and rural population does not permit of an accurate comparison for any length of time. For the year 1900 rural is defined as "all cities and towns of less than 8000 inhabitants." For the years 1910 to date cities are classed as having a population of 10,000 or more. In view of the fact that prenatal care and the standards for obstetrical practice vary in rural districts with those adopted in larger municipalities, a comparison of mortality rates from puerperal conditions might be very interesting. As best such comparisons may be made we find the rates for each year are higher in the larger cities than for the smaller towns and rural districts.

TABLE IV.

Year	Deaths from diseases caused by pregnancy and confinement											
	Number						Rate per 100,000 population					
	Total		Puerperal septicemia		All other		Total		Puerperal septicemia		All other	
	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts	Cities of at least 8,000 population	Cities of less than 8,000 population and rural districts
1900...	1,595	1,087	713	442	882	645	14.9	11.7	6.7	4.8	8.3	6.9
1901...	1,607	1,097	661	463	946	634	14.4	12.0	5.9	5.1	8.5	7.0
1902...	1,575	1,051	710	382	865	669	13.7	11.5	6.2	4.2	7.5	7.3
1903...	1,659	1,119	715	438	944	681	14.1	12.1	6.1	4.7	8.0	7.4
1904...	1,968	1,248	892	511	1,076	737	16.4	13.4	7.4	5.5	8.9	7.9
1905...	2,069	1,150	937	464	1,132	686	16.8	12.3	7.6	5.0	9.1	7.3
1906...	3,060	2,063	1,308	761	1,752	1,302	16.8	13.2	7.2	4.9	9.6	8.3
1907...	3,245	2,145	1,427	821	1,818	1,324	17.3	13.5	7.6	5.2	9.7	8.3
1908...	3,384	2,654	1,532	1,085	1,852	1,569	16.6	14.5	7.5	5.9	9.1	8.6
1909...	3,734	2,936	1,678	1,212	2,056	1,724	16.2	13.8	7.3	5.7	8.9	8.1
1910...	4,271	3,123	2,029	1,305	2,242	1,818	17.0	13.8	8.1	5.8	8.9	8.0
1911...	4,543	3,926	2,202	1,678	2,341	2,248	16.5	14.6	8.0	6.2	8.5	8.4
1912...	4,463	3,551	1,997	1,417	2,466	2,134	15.9	13.1	7.1	5.2	8.8	7.9
1913...	5,031	4,013	2,353	1,717	2,678	2,296	17.2	13.8	8.0	5.9	9.2	7.9

No doubt part of this difference may be due to the incompleteness of returns in the rural communities. Further, larger cities usually provide better facilities for the care of maternity cases. To counterbalance this, however, there is a large proportion of the city population who are laboring under a distinct disadvantage, owing to their maladjusted conditions. Among the foreign element overcrowding, poor hygiene, overwork, underpay and ignorance of the proper obstetrical care all play their part in increasing the death rate from septicemia. It may be of interest to take our last decennial period for Philadelphia and compare it by nationality (Table V).

The figures do not show a decrease in death rates for the recent years in large cities as is shown in Table IV. The rate for New York City alone shows a definite and steady decline. The crude rate per 100,000 inhabitants in 1905 was 20.3 per cent.; in 1913, 14.1 per cent. The rates of Boston, Buffalo, Detroit, Jersey City and Washington show annual fluctuations, but the general trend is to remain about the same. Newark, N. J., on the other hand, shows a great tendency to increase. For our own city the rate per 100,000

TABLE V.

Nativity	Year									
	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
United States	66	84	85	80	87	66	86	107	83	94
Ireland	10	9	9	13	6	2	9	10	5	3
Germany	6	6	3	9	9	2	6	3	1	1
Russia	14	8	10	8	7	6	13	18	11	8
Italy	10	9	6	12	4	3	12	9	5	9
England and Wales	4	6	2	3	5	1	4	2	1	3
Canada	..	..	1	1	..	..	..	1	..	..
Austria-Hungary	2	10	1	9	4	5	5	7	11	6
Poland	2	6	2	6	1	4	6	1	3	6
Scotland	1	..	..	1	2	..	1	..	..	1
France	..	1	..	..	..	..	..	..	..	..
Roumania	..	1	..	..	..	..	..	..	..	..
Sweden and Norway	..	..	..	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..	..	..	..
Miscellaneous Foreign	1	1	2	3	1	..	..	1	1	2
Not stated	3	1	1	1	..	1	..	1	2	1
Totals	119	142	122	146	126	90	142	160	123	134
Colored persons	10	13	18	5	6	5	7	11	11	15

of married females is presented in Table VI, as well as the rate per 1000 births (see Table VI).

TABLE VI.

Year	*Estimated married females	Total deaths	Rate per 100,000 married females
1907	286,505	119	41.53
1908	291,521	142	48.71
1909	296,537	122	41.14
1910	300,629	146	48.56
1911	306,568	126	41.10
1912	311,584	90	28.88
1913	316,599	142	44.85
1914	321,615	160	49.75
1915	326,631	123	37.66
1916	331,646	134	40.40

* Based on total estimated number of married females, all ages, in 1910 census.

The latter figure cannot be interpreted too literally because birth registration is not complete even now; and, for the first years included, no doubt, many births—possibly hundreds, were not reported. If we obtain the coöperation desired this year we shall have the total number of pregnant cases hospitalized, and then may be able to obtain the approximate refined rate for puerperal conditions.

Age groups, as might be expected, follow very closely women of the child-bearing period. In other words, as shown in the following table (Table VII) practically all of the mortality from puerperal sepsis is confined to the ages fifteen to forty-nine.

TABLE VII.—PUERPERAL FEVER BY AGES.

Year	Females	15–19 Girls	Age Groups			
			20–30	30–40	40–50	50 and over
1907	119	14	54	43	8	
1908	142	18	72	40	12	
1909	122	15	55	43	8	1
1910	146	11	65	57	12	1
1911	126	9	58	50	9	
1912	90	12	48	25	5	
1913	142	7	69	55	9	2
1914	160	9	83	59	9	
1915	123	9	68	39	7	
1916	134	11	62	54	7	

Conclusion.—From the foregoing it will be seen that a large number of women die year after year in this country from child-bed fever. As Dr. Oliver Wendall Holmes so aptly said; "The woman about to become a mother, or she with a new-born infant on her bosom, should be the object of trembling care and sympathy. God forbid that any member of the profession, to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly or selfishly." Why should puerperal sepsis give rise to so large a mortality in our country? First, there is a widespread ignorance of the dangers connected with childbirth, and the need of proper hygiene and the best skill to prevent them. Second, there is great difficulty relative to obtaining the proper obstetrical care.

It is high time that obstetricians teach, by precept and example, the gospel of *prevention* of puerperal complications. Fatalism has prevailed long enough in the minds of the laity concerning these conditions, and it becomes our function to supplant this idea with the more optimistic ideal of prophylaxis. Professor Irving Fisher has estimated that a certain percentage of all deaths chargeable to puerperal septicemia are preventable. The husbands of women bearing children must be taught that the outlay for skilled service is one of the necessary family expenditures. The physician must be given additional training in the handling of maternity conditions, and, if possible, the pecuniary remuneration should be such that he will have an incentive to specialize and acquire special skill in this branch of medicine. Adequate facilities must be provided for the care of unusual or complicated cases of labor in the rural communities as well as in the cities. In all localities where there is a large percentage of foreign or colored population, more especially, there must be strict supervision of all midwives. Municipalities should institute follow-up work, as well as prenatal work, to protect the lives of the mothers and their children.

And in conclusion, after a careful study of the prevailing conditions, it is evident that such bodies as represented by physicians specializing in maternal work must assume the initiative in organizing, planning and supervising many of these new lines of work. Definite standards must be established; careful supervision maintained, to the end that the sum total of all efforts will greatly decrease the maternal mortality, and give to the nation better and stronger offspring for the propagation of future generations.

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INJURIES AT BIRTH, PREMATURE BIRTHS AND STILLBIRTHS.*

BY

CHAS. SCOTT MILLER, M. D.,

Chief, Division of Vital Statistics,
Philadelphia, Pa.

THE subject of injuries at birth and stillbirths has to do with some of the most important causes of infant mortality. Of late years, as is generally known, this subject has received the most careful attention of our best obstetricians and pediatrists.

In so far as our local conditions are concerned there is an annual average mortality of seventy-three registered as due to injuries at birth. In other words the average yearly rate of infant deaths of injuries at birth per one thousand living births is 1.95. With the high water mark at three per one thousand in the year 1913, there has been a gradual decrease until the year just closing, with the rate of 1.9 per one thousand living births.

This cannot be interpreted too literally. It may mean that the figures for any year are inaccurate, or may give an incomplete picture of actual conditions because of many different factors, such as incompleteness or inaccuracy, inappropriate methods of classification or computation. Again, the figures for the various years may not be comparable because of the great improvements that are constantly being made in registration, computation and classification. Tremendous advances have been made and with each we search in vain for comparable data; fallacies are disclosed both in the registration of births and the classification of deaths. In general, therefore, the study of the actual total deaths and the death rates for the latter years are of more value than a comparison of the rates for years.

The accompanying table gives the total deaths as well as the rates per one thousand living births registered (in Philadelphia).

The factors concerned in the reduction of this mortality, I shall leave for the consideration of those better qualified to discuss that subject.

* Read at a meeting of the Philadelphia Obstetrical Society, May 3, 1917.

Year	Males	Females	Total injuries at birth	Total living births	Rate per 1000 living births
1906......	16	8	24	32,617	0.07
1907......	22	16	38	32,622	1.16
1908......	41	28	69	34,295	2.01
1909......	36	17	53	35,713	1.48
1910......	36	27	63	36,650	1.71
1911......	39	33	72	37,935	1.89
1912......	58	44	102	39,034	2.61
1913......	56	46	102	39,006	2.61
1914......	61	39	100	41,063	2.43
1915......	59	40	99	40,849	2.42
1916......	46	33	79	41,209	1.91

Premature Births.—Intermediary to the subject of injuries at birth and stillbirths comes the study of premature birth. It may be of interest to note that the ratio of premature births registered, to the total births, has decreased in the second half in comparison with the first half of the period since the year 1906.

In the accompanying table will be seen the total of premature births and total births with such a ratio.

Year	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
Premature births......	497	565	609	602	500	559	701	715	670	777	676
Total births..	34,458	34,626	36,326	37,540	38,676	40,066	41,182	40,982	42,992	42,820	43,149
Ratio of premature births to total births. One to.....	69	61	59	62	77	72	59	57	64	55	64

It would seem, therefore, that premature births are on the decrease. The median age at death from premature birth is one year with an expectancy of life of fifty years. Further study shows approximately 2 per cent. of deaths from all causes are credited to premature births. Experiences of some fifteen eminent clinicians, as summarized in Professor Irving Fisher's report on "The Conservation of National Vitality, Its Wastes and Conservation," show the ratio of postponability to be 40 per cent. of the total mortality from premature births, or 0.8 per cent. of the deaths from all causes. Supposing, therefore, that forty out of every 100 are preventable, there has been a loss of 2748 lives to Philadelphia for the period studied.

Professor Fisher has estimated that the net worth of a person in dollars and cents at birth is $90. As an economic proposition this means a loss of $247,320. Sociologically it can never be estimated how valuable a life has been sacrificed.

Stillbirths.—Another factor in the mortality credited to puerperal conditions pertains more especially to stillbirths. It is not our purpose to go into so detailed a study of the causes of these conditions as to endeavor to show the relative prevalence with which they occur during pregnancy.

The subject of stillbirths has to do with three phases, namely, the definition of birth, the definition of stillbirth and the definition of abortion, miscarriage and premature labor.

By birth is meant the complete separation of the fetal organism from the maternal body. From a statistical standpoint the umbilical cord need not be cut or tied, nor need the placenta be separated.

Stillbirth is defined as a child or fetus that neither breathes, moves or shows signs of life. This of course presupposes that the body is visible. Therefore, a child showing any cardiac action—in the true sense of the word—is not stillborn. In other words, a child dying a moment before delivery constitutes a stillbirth, while one dying a moment after delivery falls into the classification of living births.

The third point offers the greatest source of error. Medical definitions permit of a certain latitude in regard to the difference between the three terms abortion, miscarriage and premature labor. Some authors define the expulsion of the products of three months or less intrautero gestation as an abortion. Others extend the period to the age of viability (approximately six and one-half months).

The term miscarriage is somewhat confused in the mind of the average practitioner of medicine and is often used interchangeably as a synonym for abortion or premature labor. Premature labor on the other hand is often construed as meaning any labor which develops before the calculated time. Of course, these definitions are in the main erroneous and will require some exact differentiation before they can be accepted by the general practitioner. It seems only reasonable that a very definite stand should be taken by a society similar to the Obstetrical Society of Philadelphia, which might make definite recommendations to the faculties of the various medical schools and thus obtain a uniform standardization of terms. The most generally applicable view seems to me to be as follows:

Abortion.—The expulsion of any product of conception prior to four months or subjectively before the age of "quickening." At this period the placenta is not definitely distinguishable from the remainder of the chorion.

Miscarriage.—The expulsion of any product of conception from the age of four months to the age of viability, usually considered to be about six and one-half months intrautero.

Premature Labor.—The expulsion of any fetus from the age of viability to full term.

According to this division a stillbirth might fall into either of the two latter classifications and all births either living or still in these two classifications should be reported under their respective headings. In this I coincide with the opinion of the State Registrar with whom I discussed the matter some time ago. Certain neighboring states aim to have all the products of conception, from the earliest possible period, to be reported as living or stillbirths. From the medical point of view this is impracticable as often neither the patient nor the physician could make a positive clinical diagnosis of pregnancy in the early stages without careful and detailed study. This applies more especially to the members of the profession in general practice. Without proof of organized material or very clear and definite history it seems there would be as great a variance in excess of our present number of stillbirths as we now have deficiency under our present system.

The City Registrar of Providence, Rhode Island, has issued the following set of rules to all the doctors under his jurisdiction:

1. "Ask but not require that *all* stillbirths irrespective of the month of uterogestation be reported as births on the usual birth blanks. Unless the embryo has attained the age of six complete months of uterogestation the stillbirth will not be reported nor will it appear in the standard tables of stillbirths but will be placed on file for future statistical use.

If, however, a child born before the end of the six months shows any sign of life it must be reported as a living birth.

2. Require that all stillbirths occurring after the six months be reported not only as births, but in accordance with the State law must also be considered as deaths. A mortality certificate properly made out will entitle the undertaker to the usual burial permit as in the case of adults."

There are certain times when for one reason or another the physician's certificate of death is altered before it reaches the registrar's office. Frequently the doctor certifies stillbirth and the age is given as one, two or three minutes. The alteration is so apparent that for statistical purposes what appears to be the usual handwriting of the physician is accepted when making our classification of living and stillbirths.

If some uniform standard were adopted throughout the registration area in the manner of interpreting these three phases it would be a great advancement in medical as well as statistical progress.

Frequency of Stillbirths.—In view of the confusion of ideas, first, regarding the definitions; second, regarding the filing of these certificates, all statistics quoted may be considered approximations. It is almost impossible to obtain a correct estimate of the frequency of abortion. Many women lose the ovum at an early period of its development when they are not conscious of being pregnant. Others fail to seek medical advice in the absence of complications. Therefore, it is fair to assume that even our approximations are low.

An attempt is being made by the Division of Vital Statistics to obtain a so-called "Pregnancy Index." It is not our purpose to check birth reporting, as this is now a state function, but we hope to learn the percentage of hospitalized pregnant women who give birth to children prematurely, who abort or who miscarry. By means of ascertaining certain data as shown in the accompanying blank with regard to these hospitalized cases, we hope to estimate more accurately than heretofore the number of pregnancy cases in the city as well as the percentage aborting, miscarrying or going into premature labor.

EXHIBIT 1

________________Hospital

During the month of______________________191 , there were the following number of

Total pregnant cases	Living births		Stillbirths			Miscarriages and abortions		Criminal abortion	Therapeutic abortion	Unsuspected cases discovered at D and C's
	Full term	Premature less than 7 months	Full	7–9 mo.	4–7 mo.	2–4 mo.	Less than 2 mo.			

Informant______________________

Title______________________

So far as abortion is concerned it has been estimated by various observers that there occurs one abortion to every four pregnancies. According to our definition all abortions would necessarily be stillbirths although the converse is not true. For the last eleven years the number of stillbirths with the ratio of stillbirths to total births is shown in Table I. The average for the first five-year period is one stillbirth to approximately every nineteen total births. For the last six years the ratio has been one to every twenty-one total births.

Year	Stillbirths	Total births	Ratio of stillbirths to total births
1906	1,841	34,458	1 to 18.7
1907	2,004	34,626	17.3
1908	2,036	36,331	17.8
1909	1,827	37,540	20.5
1910	2,026	38,676	19.1
1911	2,131	40,066	18.8
1912	2,148	41,181	19.2
1913	1,976	40,982	20.7
1914	1,929	42,992	22.3
1915	1,971	42,820	21.7
1916	1,940	43,149	22.2

In a recent letter from the secretary of one of our neighboring state boards of health, he states that while to his knowledge there is no city that sophisticates its mortality statistics by unfair classification, he did know of one western city which discounted its total mortality by subtracting all deaths under the age of two weeks. In other words it regarded all children dying under the age of two weeks as stillbirths. This had been done for years and years with a resultant conspicuously low general mortality.

Sex.—In the accompanying diagram (Fig. 1) some idea may be gained of the stillbirths by sex as compared with the living births by sex.

Etiology.—The factors which may be held responsible for stillbirths fall under two general headings. First, maternal conditions; second, conditions effecting the fetus. Under the first general heading might be classed such causes as unusual exertion, unusual irritability of the uterus, various toxic states of the mother, overdistention of the uterus, etc. Under the second heading might be considered certain pathologic conditions of the chorion or of the ovum itself.

We have been able to gather in the short space of time allotted to us 100 stillbirths. Of this number exactly fifty gave no contributory cause of death, while thirty-six stated as contributory cause premature birth. Of the remaining fourteen, which are not a sufficient number on which to base any estimate of frequency, the following causes were given:

Syphilis	4 cases
Injuries at birth	5 cases
Strangulation of the cord	3 cases
Polyhydramnios	1 case
Convulsions of the mother	1 case

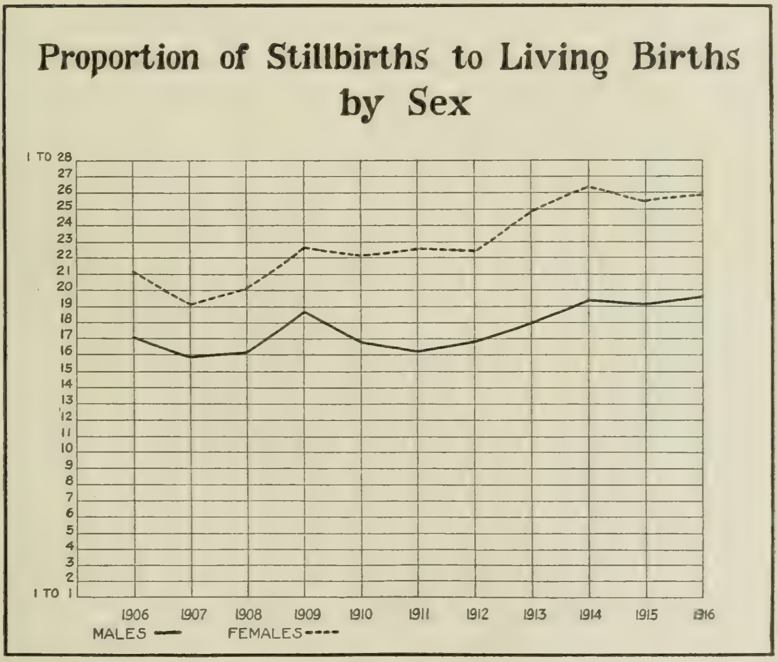

FIG. 1.

It becomes apparent, therefore, that in dealing with the subject of stillbirths as practitioners of medicine, we have an unlimited field for investigation and research. There should by all means be a more detailed statement made on the mortality bills as well as a proper classification and standardization of our terminology.

In conclusion I would ask that this Obstetrical Society endeavor, either collectively or as individuals, to first endorse the definitions as quoted and second, give as full and detailed a death certificate for all stillbirths as is possible. From a statistical standpoint we will then be able to have a very definite working knowledge and in addition render assistance in the study of this condition which demands an average toll of 1984 deaths per annum.

OBSTETRIC PROBLEMS AND THE CORONER'S OFFICE.*

BY

WM. S. WADSWORTH, M. D.,

Coroner's Physician,
Philadelphia, Pa.

For one not actively engaged in the practice of obstetrics to address this Society requires either assurance or some unusual experience. Were the society devoted to pure science others might speak with authority and a likelihood of being interesting but to you the problems are practical. I shall not speak to you as a trained student of either biology or of psychology but rather as one whose daily task is to solve problems such as you meet in practical obstetrics. As I find the greatest help in reaching solutions of these problems in these two great fields of science, I shall perhaps be pardoned if I venture to draw your attention to certain biologic phases and interpretations, because I am convinced they are of the utmost importance and can be used by you to advantage. Of the psychology of pregnancy and the child I shall not speak because at present the medical profession in this country is almost destitute of either training or understanding of the whole field of psychology. I am invited to speak from the coroner's point of view of these problems. Considering the general state of information regarding the coroner's office it may be well to tell you something of the reason why I presume to speak to you on obstetric problems. During the past eighteen years I have investigated over 5000 cases in the Coroner's Office of this City, many of which have required the most careful dissection and study. Of these roughly 10 per cent. were of young children and over 4 per cent. of women who were or had recently been pregnant. Many more presented phases which constituted obstetric problems.

When I glanced over my index of the obstetric problems which I had considered in connection with cases, the subject cards alone counting up over a thousand, I was easily convinced that I should have to select either a few special topics that might appeal to you or which had particularly attracted my attention or else give you a more general talk on the solving of obstetric problems in general with some illustrations, laying special stress on certain matters which appeared to me to need attention at this time, having regard to your literature and practice and the topics occupying the public mind. I have chosen the latter course.

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*Read at a meeting of the Philadelphia Obstetrical Society, May 3, 1917.

Of abortion and birth control I will not speak at this time because the subject is too large, too much in evidence, too unpleasant and I fear cannot be treated in a hopeful way.

Of extrauterine pregnancy you have heard quite enough that was excellent at your own meetings.

Of nosology and vital statistics you will hear from another to-night.

Of puerperal infection you have already heard at least from a statistical point of view. Of the reasons why women and young children die as the result of obstetric factors I shall say a few things which I believe are worth the consideration of all those who aspire to be anything more than accomplished midwives, male accoucheurs or surgeons.

Of the long list of problems which have to do with the actual practice of the art of midwifery I shall say little because you should know more of these things than I do, but I would have you remember that of these things not a few come to my attention in such a serious way that I am often compelled to pass judgment, not only on the manner of the doing, but, on the occasion for and effects of the doing. In a general way every obstetrical problem may at some time present itself for consideration at the coroner's office. In the same general way almost every problem in medicine and the allied arts and sciences may appear, to worry the coroner's doctor.

I know of no other office or position in City, State or Federal government where such a variety of medical problems present themselves for solution as at the coroner's office in a large city. I am fully aware that this fact is but dimly suspected by even the best informed person either in the medical profession or outside. You would all be astonished if you were to sit with me for a month and observe the cases which pass through the office and note the variety and intricacy and difficulty of those cases. You would be still more astonished were you to realize how important it often is to have properly solved the problems no matter how suddenly they arise, how trifling they appear or how difficult it is to elicit the truth from the available witnesses, not excluding those of the medical profession. It seems a great pity that work requiring many thousands of doctors scattered throughout this great land should have such totally inadequate recognition that few care to take it up permanently or seriously. Until state medicine is recognized and understood by the profession and the public at large and specially at our teaching schools, conditions must remain as a disgrace to American medicine. What is regarded with great seriousness by most other civilized nations is a subject for ridicule or indifference in our own country. We have not one good medicolegal institute in this country and not a single school where a decent pretense of a preparation is provided for, either as part of the compulsory, elective, or post-graduate courses of study.

Until this is changed, and most radically, we will continue to see pseudoexperts, not rarely men holding professorships in noted institutions for the teaching of medical students, making the most pitiable exhibitions of their total unfitness to discuss the problems they are pretending to discuss in the courts of the country.

To-day the average medical expert is the laughing stock of the whole community and the whole medical profession suffers incalculable harm and has just so much harder work to gain the recognition it so ardently wishes for and justly deserves. If the whole profession as well as all the branches could but realize it, there is no field where betterment would yield more important or lasting results in the raising of medicine to its proper place in the social structure. The obstetric branch of the profession has a peculiar interest in this matter because many of its members appear in courts. Some go as real experts and receive a well merited recognition; others go, not as witnesses but for trial and unfortunately some go to help the guilty escape the penalty for their acts. This latter phase has done not a little to discredit the profession and has raised a degree of contempt which is not to be easily overcome. For the "consultant," who too systematically is found ready to curet after an abortionist has done his work, soon comes to hold the same relative position to the abortionist as the pawnbroker does to the robber. As an offset to this unpleasant state of affairs I am glad to say that obstetricians as a whole bear an excellent reputation and that I find a high degree of understanding both of the theory and practice of their subject. In fact, the high stand of your Society has emboldened me to take up some matters which might be counted too technical and scientifically difficult for general discussion. One of these is the manner of considering obstetric subjects in the literature. It is usual and to a degree necessary to subdivide the subject into topics or groups. There is, however, a very real and serious danger which is inherent in such grouping—that is the danger that we will come to neglect the natural unity of the problem no matter what phases or points of view or categories we may employ.

Obstetric problems cannot be garbled or cut out of their setting either by a time scale which divides the processes at points of time when certain things happen, such as impregnation, pregnancy, labor, the puerperium, nor can they be sorted out under the usual medical topics as anatomy, physiology, pathology. They must remain for us always as single problems, no matter how many or how varied are the different component factors. Too often do I see practically bad results following this forgetting of the natural relationships because of the faulty habit of disassociation.

It should ever be remembered that no problem can be solved by intensive study of the various phases unless we employ the intensive method of reconstruction whereby we arrive at true judgment regarding the value of each phase and the relationships existing between the phases.

At the present time obstetrics shows with the rest of medicine this dangerous, we may almost say stultifying, modernism, whereby the part is regarded as of more import than the whole and one erratic fad is chased, as long as the fashion lasts, to the neglect of the ninety and nine tame old subjects and the utter failure of sound judgment and the substitution of impossible theory for real comprehension. I grant you that progress is to be made through intensive study of the separated phases but only when the results are brought back and fitted into the whole system.

The exalted values given to partial knowledge acquired by the intensive method are not infrequently due as much to intensive ignorance of other phases as to emotional enthusiasm for the results obtained in the favored phase. I wish I had time to give you instances of how this modernism, this phase intensity, causes the most dreadful blunders, for I am sure I would demonstrate to your satisfaction that I am speaking of something that lies at the very basis of most of the stupidity and error that lead to results only to be classed as ghastly.

Cbstetric problems, like many other medical ones, begin in the dim past and end in the future and while we deal actually only with the present we cannot escape our duty to consider the beginnings and the outcome. The thinking obstetrician—and I am not interested in any other—must consider the whole sex problem in all its biologic, psychologic and sociologic bearings, and problems of inheritance and environment are constantly demanding attention. We come to know the prose meaning of the poetic saying that—the fathers have eaten sour grapes and the children's teeth are on edge, though we soon learn that the festivities of the mother are not to be forgotten.

We gain more or less insight into the relation of sex to crime, as well as to health and disease, and learn that the ethical scale from pious procreation to rape rests on the biology and psychology of this sex problem. We see degeneration following both unbridled sexual excess and abnormal sexual restraint and find the problems of the family quite as large and difficult as those of free love. For our work we may minimize the psychology, though for social science this cannot be left aside or ignored, but we cannot hope to make the slightest headway in our understanding or practice unless we are alive to the biology of our subject.

To hold that such problems as stillbirth and sudden death of mother or child are a bit less dependent on biology than those of conception, evolution and nutrition of the child or the physiology of the mother during and after pregnancy is to evince either gross ignorance or mental unbalance of a grave sort.

I am quite well aware that there are many get-wise-quick games that are being pulled over on the medical and social public by quacks of both groups, wherein no biology appears beyond a few cant phrases borrowed from the biologic jargon and that at the present we are subjected to a frightful noise regarding sex problems, medical education, child training, infant mortality, eugenics, the social evil, official pregnancy, sterilization of undesirables, free love, race betterment, limitation of families, race suicide, selection of parents, the sexually unemployed and similar great and weird matters. These all hold obstetric problems which you and I must meet and solve along with the perfectly respectable ones of daily life but they never will be solved by emotion or without biology and they will be solved only by sound common sense.

All obstetric problems whether of pure science, practical art or gregarious chatter must rest on biology and can only be understood by avoiding the errors of the crazy intensive fragmentization of ultramodernism.

There are a few of the many problems to which I would invite your special consideration:

1. The influence of previous local conditions of the birth canal, more especially in regard to cleanliness or local disease, on pregnancy, labor, the puerperium and the child. The general filthiness of the birth canal is fairly well recognized. This at times reaches the quality or intensity of disease, but aside from the class called venereal,

is far too little discussed or understood. So much suffering and sorrow to both sexes results from this that our neglect of the matter is wholly inexcusable.

I cannot recognize any indelicacy in considering any problem of vital import and I am convinced from my own observations that very great harm is done both the mother and the child from our lack of action and speech. It might well be made, indeed should be made, a part of the program or propaganda of eugenics, for the unsanitary housing of the unborn child is not a matter to be lightly ignored and not a little of the puerperal sepsis is directly due to this factor, though for some undiscoverable reason it is not often recognized.

2. The problems of congenital diseases are at present in the crudest state owing to the lack of mental training along lines of biologic thinking of those who talk most. It is not enough to have a passing knowledge of the selected few landmarks of embryology but it requires something of a realization of how cells act both as individuals and more of their social proclivities and organic tendencies, or impulses to build and sustain an organism, with some grasp of those things which can and do influence such inherent organization sustaining vitality. Unfortunately, the study of sex biology has too often been in the hands of those whose minds have been perverted by a lust for the erotic which has been so evident in their work as to repel and offend many sane and sound persons who would otherwise gladly have followed biological study.

The pursuit of the sexual phenomena to the ultimate, with a failure to note or consider the vast and marvelous unfoldings of protoplasmic potencies, on one side, and the endless puzzle of the dead-cell appearances, lighted only by the tallow dip of germinal-layers theory, on the other, have perhaps caused some medical apathy.

The problems of human inheritance and of the influences which affect prenatal life are far too important to allow us to much longer be satisfied with any excuse for apathy toward the biology of development.

The realization that a single cell becomes a parent of a complex individual rather than of a host of single cells similar to the first one must lead us to consider what forces there are which drive the new cells to unite in an orderly way and further, the conception must grow up that what we must consider throughout are potencies and forces of which cell structures are but the indices. I do, therefore, beg that you will more and more seriously consider the reasonableness of using biological thinking when striving to solve the problems of pre- and postnatal life.

3. The marvelous potencies and kinetic forces of the embryo cause the taking up and arrangement of matters along lines of rigid law. These things are becoming clearer to our mental vision until we are seeing as the gods "the members while as yet there are none of them."

But we must not forget the *environment* nor may we limit that to the uterus alone. We must consider the whole body of the mother. There are problems of biochemistry in pregnancy, the importance of which we are commencing to realize and which, when comprehended, will do more to clear up the causes of disasters both of pregnancy and the postnatal period for mother and child than any other single group of subjects. Chemical adjustments begin very early in the mother which tend to encourage cellular activity. The signs of such are easily noted in the pregnant woman, the effects of which on the child are of tremendous importance.

Is it any little thing then to ruthlessly employ chemical substances that will surely produce monsters in the lower forms of animal life? We know that certain drugs and chemicals do great harm to the lower animals during embryonal life. Should we not stop and think before we employ such drugs as magnesium sulphate in the pregnant woman?

It is well for us to consider the minor biology and biochemistry of the very low group called bacteria and some day we may graduate from such elementary subjects into major biology and major biochemistry of the human animal and his young.

4. The death of the fetus within the mother I am told is less common than formerly. I find many dead children that have never breathed and as they are often "unknown" no history can be obtained. Not rarely a mother claims that her child was stillborn whereas it was very much alive at birth.

Science can only consider a child as live born that has breathed. Sophistries in abundance can be indulged in as to what constitutes legal or ecclesiastic birth but common sense recognizes that birth means the separation of the child from the mother and the only evidence of independent existence must rest on the absolutely fundamental function of respiration without the existence of which the child cannot live. I find far too little attention paid to the whole problem of respiration in the new-born, both in law and medicine. English law was too subservient to matters of property claims, miscalled rights, to be openminded on any scientific subject and we must only hope for a very gradual liberation of the law from this stultifying influence of English Common Law but there is little excuse for such stupidity in the more enlightened field of medicine.

5. Death at birth is in the great mass of cases associated with some form of respiratory failure.

The breaking up of home ties, the pulling up of the little parasite by the roots, is a very serious matter and the adjustments which made pregnancy possible were but the forerunner of serious and important adjustments that reach a climax at birth.

The heart has been doing its work for a long time and if we consider the structure of the cord and placenta we must realize that such work was quite as severe as that required after birth. The brain and gut have little to do in the first hours of the new-born. The absorption of the blood from the placenta is a matter of more importance than I find often recognized.

One seldom hears of shock in the new-born and this is probably not wholly an oversight. Infections have not had a chance to develop but the respiratory mechanism from nose to nerve centers has a very new task, to be suddenly undertaken and continuously maintained. About these matters your literature and speech as far as I am able to see are strikingly deficient. You do not seem to grasp either the findings or the significance.

6. The problems of death at birth merge naturally into those of the new-born. The respiratory factors are still great and often unrecognized.

Too often some mechanical source of external asphyxia is given as the cause of death where no such source existed. Often there is pure respiratory asthenia. Commonly there is a prenatal or congenital condition of the air passages which amounts in not a few cases to a distinctly recognizable disease, best termed congenital bronchitis (though such a cause is not listed in the International list of causes of death). The plethora produced by the absorption or withdrawal of the blood from the placenta and some inherent vasomotor weakness and hypersensitiveness often lead to sudden congestions, more specially in the lungs but at times in other organs.

This congestive tendency is to a degree recognized, practically, but one hears far too little about it, if one gives due recognition to its frequency and importance.

This naturally makes us wonder why so little real study is given to the subject of infancy in our medical schools. No one can gain a true conception of the tissues, organs, qualities or in fact any of the essentials of children by simply studying the adult. The organs have the same names and general location but chemically and vitally they are all very different.

It is a matter of no little importance to the community that the great mass of medical students are graduated with no realization of what an infant really is from any point of view and when one sees the mass of the profession continuing to the grave with this same stultifying ignorance it becomes appalling. The matter deserves the earnest attention of everyone but especially of those whose specialty brings them into contact with problems of infant life. While this matter more immediately affects those whose special work is the care of children, it deeply interests the whole race.

7. Infections in infants.

I find from my observation and study of cases that the cord is infected or is the path through which infection enters where no suspicion existed of the actual condition. This has only been fully realized in the matter of tetanus of the new-born.

Very early in the life of the child the gut becomes infected in not a few cases. This starts in the nose which seldom receives its due share of attention. In children fed on cow's milk many bacteria gain entrance by the mouth. Such infections are certainly not matters to be ignored.

It is very common to find the glands of the mesenteries highly involved and other evidence of dissemination usually occurs. One of the results is a general glandular involvement, and other special local changes appear. Still another infection is that by the migration, more especially in girl babies, from the rectal discharges to the urinary tract, even going as far as the kidneys.

The glandular phenomena of early infancy are of the greatest importance for the glands respond to the calls for chemical adjustments, not alone of immunity and infection but of growth and development. It is well known that the glandular tissues of the new-born are enormously out of proportion to the other organs and the body as a whole. The significance of this fact must always be remembered. The thymus is only one of these glands but has received more attention than some of the others, but even in regard to the thymus diseases there seems to be a tendency to lay great stress or pressure upon the trachea which is a relatively firm and resistant tube while very little attention is given to the pressure on the blood-vessels in the upper mediastinum and base of the neck.

I have studied several cases where the symptoms and findings showed clearly that death was due to compression on the blood-vessels. In one the facial cyanosis was so marked that a diagnosis of heart disease had been made. There are so many problems related to the glands in infants that seem to be intimately related to development, disease and death of the child that I leave the subject only with reluctance, more especially as I am fully convinced that we are not in the habit of observing the perfectly obvious in many cases that we should study.

A brief word on the relation of obstetrics to state medicine. We are just now doing something in the matter of gathering statistics. More must be done and these matters must not be left to those whose interests are more clerical than scientific.

We are examining and regulating doctors and midwives but are leaving the training of parents to the volunteer efforts of young enthusiasts not a few of whom are unfit for the task. The State has done something along the line of pure food and pure milk but who is doing anything worth while on the subject of toxicology of the unborn child? The laws in general are made by lawyers, not rarely in the interest of law business, and lawyers too frequently only interest themselves in medical subjects and seek medical advice or help when they wish to use the doctor in court. The medical profession is slowly waking up to its ethical duty toward legislation but we must all feel that much remains to be done along this line.

Perhaps I have given you some insight into how the obstetric problems appear, at least to one Coroner's physician.

PRENATAL CARE.*

BY

FLORENCE C. CHILD, M. D.,
Division of Child Hygiene, Bureau of Health,
Philadelphia, Pa.

Obstetrical prenatal care has for many years been an integral part of the work of every competent physician who assumes the care of women during pregnancy and labor. He has not recorded it as a separate consideration, but nevertheless he has given it. The definitely systematized social aspect of prenatal work is a distinctly new phase, the value of which has only recently been fully recognized. An investigation into the extent of prenatal care in this country, shows that such work is now being done by 286 agencies (including municipal and private organizations) in 186 cities of this country. The number is constantly and rapidly increasing, as can be proved by the report of two years ago, when there were but fifty-four organizations in thirty-nine cities.

The first organization to instruct pregnant women in suitable care and hygiene was the Visiting Nurse Association of Boston in 1901. In 1906 the Visiting Nurse Association of Chicago took up the work. In 1908 the Association for Improving the Condition of the Poor and the Pediatric Department of the New York Outdoor Medical Clinic began specializing along these lines. It was not until five years later, in 1913, that the value of prenatal work had been so successfully demonstrated that the work in New York City was taken over by the Division of Child Hygiene of the City Health Department.

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* Read at a meeting of the Philadelphia Obstetrical Society, May 3, 1917.

The rapid increase in the number of organizations doing prenatal work shows that the country as a whole is waking up to the realization that the most fundamental step in this nation-wide movement for child betterment is the prenatal care of mothers.

When we are confronted with the appalling fact that one-third of the deaths under one year of age occur in the first month of life, and that approximately 70 per cent. of these are during the first week, we cannot fail to realize that the cause must be sought in conditions existing before the birth of the child.

The health and welfare of the pregnant mother is a subject of almost unlimited scope. "Although the medical side of prenatal care is conspicuously important, medical oversight alone can only produce a part of the desired result, since the welfare of women at this time is very largely determined by the social conditions surrounding them." (Children's Bureau, Washington, D. C.)

It has been said that prenatal care goes back 100 years before the baby is born. This statement may seem slightly exaggerated, but it is undoubtedly true that, in its broadest sense the problem of prenatal care begins with the prevention of marriage of the physically and mentally and morally unfit. It is the right of every baby to have a healthy body, and this inheritance cannot come from unhealthy parents.

In its more accepted sense, the care of the expectant mother combines:

1. The purely professional work of the physician; 2. the partly professional and partly social work of the visiting nurse; 3. the purely social work of coöperating agencies (usually charitable).

It is not the object of this article to dwell upon the part played by the trained obstetrician, but rather to describe what is being done along prenatal lines by the Division of Child Hygiene of Philadelphia with its forty-eight municipal nurses.

Twenty-three out of the forty-eight wards are covered by nurses. This includes an area of about one-fifth of the city. In considering the plan of work adopted, it must be remembered that it is done almost exclusively in the more congested and poorer districts, and not in what are called the better class of residental sections of the city.

Unfortunately at the present time, there is no central bureau for registration of maternity cases. The notification of pregnancies to some local authority would greatly facilitate matters, and give the necessary information to insure prenatal care for all of these women, not already properly advised.

There are various ways in which our nurses receive information concerning these cases. A large majority of them are referred by dispensaries or hospitals that they have visited, or else by some charitable organization interested in the family. Oftentimes in her regular visits to the year-old children, the nurse will find that another baby is expected. Another source is—that neighbors will sometimes tell the nurse of pregnant women living on their street or in their block; or perhaps a woman will ask her neighbor (whom a city nurse is visiting) to send the nurse to her. There are also a few cases obtained in the following manner: when pregnant women are noticed on the streets or at their front doors, by the nurse on her daily rounds, if she feels that her visit will not be objectionable, she will talk to the woman in a pleasant manner, and tactfully find out in what way she can be assisted.

In spite of the fact that the system of obtaining the cases is rather haphazard, nevertheless the nurses have been able to reach and help nearly 2000 prospective mothers during the past year (1916). Following are a few of the more interesting items which have been selected from the Annual Report:

About one-third of the cases were cared for in their homes by private physicians.

Approximately one-fourth were delivered at home by dispensary doctors, and the same number by midwives.

The rest (a much smaller proportion) went into hospitals.

Normal delivery		1775
Abnormal delivery		139
Instrumental delivery	58	
Hemorrhage	1	
Prolonged labor	64	
Breech	3	
Twins	4	
Placenta Previa	1	
Cesarean section	4	
Difficult delivery	4	
Abortion		18
Miscarriage		13
		1945

Prematures	25
Stillborn	31
Died in twenty-four hours	41
Normal babies	1829
Inflamed eyes	7
Breast fed	1830
Artificially fed	2
Mixed feeding	2
Deformity	1
Mother died	1
Mother septic	2
Mother, mastitis	2
Eclampsia	1

The first visit of the nurse is more or less of a "feeler," in which she endeavors to gain the confidence of the mother and to make her understand that she is there in a spirit of friendliness, rather than in a spirit of investigation. Although it has been said that "the poor are pathetically approachable" they, as well as all other classes, object strenuously to being officially investigated. At this time also she will make a sanitary survey, not only to see if the roof leaks, or there is water in the cellar, or if there are any other gross defects, but also to see if the house is clean and orderly and well ventilated. The social condition may need adjusting—perhaps the father of the family is out of work—perhaps the children need shoes. No matter what the existing conditions are, the nurse is the agency for referring those needing assistance to the various organizations giving it. The only actual material help given by the Division is the provision of free milk and, in the summer time, ice for prenatal cases unable to purchase it. Two hundred and eighty-one expectant mothers were supplied in this way during the past year.

If the case appears to be normal, the nurse will make her visits once a month at first, and during the later months of pregnancy twice a month, and every week as the actual date of confinement is more nearly reached.

At the first visit the woman is told the necessity of placing herself under the care of a good physician or hospital (according to the family income), if she has not already done so. The advisability of breast feeding is urged upon the mother first, last, and all the time. Frequently the nurse will tell her that nine babies out of every ten that die of bowel trouble (and more die from this than any other cause) are bottle-fed. Neither is the breast-fed baby so likely to get other diseases, and if attacked has a much better chance of living. Aside from actual disease or death, there is no other food as good as mother's milk to give the baby strength for his hard fight in life.

Most of the nurse's teaching deals with facts essential for the mother's guidance, facts of hygiene and normal living, which knowledge every mother has a right to possess in the interest of herself and her unborn baby. She tells the pregnant woman of the probable tendency toward constipation, and the necessity of having at least one free bowel movement a day. If this tendency does not exist she advises a laxative diet, containing fresh fruits if possible, also oatmeal and other coarse foods, etc. Provided dietary measures do not bring about results she advises the patient to see her doctor. As to the *quantity of food* the nurse explains to her that the baby gains most of its weight during the last four months of pregnancy, and one-half of it in the last two months, therefore the mother should eat more of the nourishing foods during this time. For a normal case the regular diet during pregnancy is the same that has agreed with and nourished the patient in a nongravid condition, except that in a general way more vegetables and fewer meats are indicated and a decidedly larger proportion of fluids.

At all times the effort is made to reach the women in their own language of expression and explain things in a manner that will be within their grasp. The nurse will try to tell the mother that besides keeping her skin clean, she must wash out her body inside by drinking a large amount of water, which will carry away not only her own waste material, but that of the baby also, and that if these substances are not taken away, they may make her very sick.

Another subject that is brought up by the nurses is the advice to guard against overexertion, heavy lifting, etc. Often a woman will come to her with the fear that the baby will be "marked." In these cases the nurse relieves her anxiety by explaining that maternal impressions have probably no effect whatsoever on the unborn child, and she will take this opportunity of advising the mother not to believe any of the other foolish superstitions that are current among the more ignorant classes.

As a summary and conclusion the following extract is quoted from one of the pamphlets issued by the Children's Bureau of Washington and dedicated to the average mother of this country: "every pregnant woman should strive to keep in mind the *simple rules for health*, the most important of which are:

1. Guard scrupulously against continued constipation.
2. Avoid an excessive quantity of meat.
3. Drink a liberal amount of water.

4. Take plenty of outdoor exercise, and keep all the rooms of the house well ventilated day and night.
5. Bathe every day.
6. Wear light but suitably warm and comfortable clothing.
7. Sleep at least eight hours out of twenty-four and do not become overtired at any time.
8. Have the urine examined at stated intervals.
9. Strive to be happy, seek self-control and do not worry.
10. Consult the doctor when symptoms of illness persist.

If then, the mother lives in such a manner as to establish and conserve her own health, taking plenty of sleep and exercise, eating sensibly of simple foods, and in every way striving to take the best possible care of her own body, so that the digestive, assimilative, and excretory functions are carried on in the highest degree of efficiency, she can be quite sure that the child will be able thereby to build up for himself a sound and normal body and brain. On the other hand, if a woman neglects these plain rules of health and goes through her pregnancy repining or lamenting her condition, paying but slight attention to her own bodily functions, it is conceivable that the child may thereby be robbed of some of the nutrition he needs for his own best development. There can be little doubt that many puny, wailing babies did not get the right sort of nutrition during the prenatal period, and that their nervous condition, often attributed by their mothers to 'maternal impressions' and nervous states that occurred during pregnancy, are really due simply to the lack of proper nourishment when the little body was beginning its growth, and doubtless many infant deaths are traceable to these causes."

MATERNITY INSURANCE.*

BY

LOUIS LEHRFELD, M. D.,
Philadelphia, Pa.

THE socialistic principle of equal division of the profits and losses among those especially concerned or affected has spread like a plague throughout Europe as manifested by the enactment of legislation protecting the wage earner from losses caused by sickness or invalidism. This country now faces the same problem of insuring and assuring the productive element of the public against adverses in time of lowered vital state. Within the next decade three-fourths of the practice of medicine will probably be under contract.

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* Read at a meeting of the Philadelphia Obstetrical Society, May 3, 1917.

This subject cannot in any way be looked upon lightly by you as obstetricians since the woman of to-day claiming equal rights in the commercial field has, therefore, the privilege of demanding protection during the lying-in period which must certainly be classed as a cause for interruption of her right to contribute toward the family support.

The progress of civilization with all its haste and time-saving inventions, has taken the woman from her home where weaving and spinning were part of her domestic duties, to the factory and the crowded sweat shop where conditions are certainly not ideal for the development of physical strength and vigor so essential for motherhood. The increased cost of living has caused a tremendous exodus of housekeepers from the home to the shop, store, office or factory, where gainful employment may assist the chief wage earner in the effort to keep up with the times. The number of married women in the field of the employed has increased so rapidly in the last ten years as to equal 3 per cent. of the total number of wage earners in the United States, of which there are thirty million.

The significance of this fact may not appear evident on first thought but when we consider that the one million married working women in this country are to be the mothers of a new generation of wage earners we are at once impressed with the dangers of confronting such a race which must of necessity be reared under conditions less favorable than those under home environments. Statistics clearly show that the number of stillbirths and the rate of infant mortality are much greater among working women than among those not gainfully employed. The diseases incident to occupations are such as to render the female worker less fit to endure the trials of motherhood. Furthermore, among the low wage earners there is a tendency to work close up to the period of confinement, which is especially detrimental to the life of the child. There is a likelihood of the same mother returning to work before the full period of physiologic rest, resulting in pelvic complaints at a later period. The child also has a greater struggle for existence through lack of natural feeding occasioned by the absence of the mother from home during working hours, for infant mortality is determined not only by the factor of breast feeding, but also by the duration of breast feeding.

Employment of women is thus causing both a decrease in the duration of nursing and in its frequency. The effect on the offspring is becoming rapidly apparent in the larger number of school children who are found to be poorly developed, ill-nourished and who show many physical defects indicative of early neglect by the mother.

Motherhood and infanthood must be protected and the needless loss of life occasioned by childbirths among women and the appalling infant death rate should be checked. In 1913, about 15,000 women in the United States died from conditions incident to childbirth. In the same year approximately 250,000 babies died before their first birthday. Fully 25 per cent. of these could have been saved. The problem is surely a good sound business proposition. The medical profession in all its earnest propaganda of education has failed flatly in showing an appreciable result along these lines except in isolated instances. Education is long, delayed, tedious and expensive, more especially in the hands of busy doctors. Those few who have specialized in public health work have proved beyond all doubt, the value of education in preventing disease and premature death, but as was mentioned above, the work is slow and the advance slower.

There is need of some great sweeping measure which will awaken interest in the protection of infancy and motherhood. The enactment of laws aiming to safeguard these natural assets are indications of their acknowledged importance. Widows are compensated in many states for the maintenance of their children, women are protected against occupational diseases by shorter working hours, and against hazardous employments; and in four of our states regulations are in force requiring a definite rest period after confinement. There is need however of more extensive legislation affecting those classes which in time of sickness cannot well afford the proper medical treatment, care and supplies.

Insurance seems to be the universal cry for the protection of maternity. Grant that its advantages are worthy of trial, its detail management must be planned by our statisticians and actuaries. That portion which concerns the doctor should be submitted to the profession for perusal before enactment or else we will have the same disagreements as resulted in the Workmen's Compensation Act.

One thing will be definitely accomplished and that is the elimination of a large proportion of free medical services. Every insured mother will demand private and undivided attention. Nursing, medicines and abundant care will be forthcoming at the expense of the State, the employer and the insured. Neglect will be a factor of the past; expert supervision will be demanded at a markedly reduced rate of charge. Nothing will be unpaid for. The practice of midwifery will be divided among all physicians and no set few will be given favoritism. There will be no hoarding of patients and the greater part of the practice of medicine will revert back to the general practitioner. But other than self-interest to the doctor, the public itself will receive the greatest benefit and the country at large become wealthier by reason of better mothers, better babies and better citizens.

702 South Sixtieth Street.

REPORT OF A CASE OF ACUTE INVERSION OF THE UTERUS FOLLOWING PARTURITION.*

BY
JOHN M. GRIFFIN, M. D.,
Warrensburg, N. Y.

Acute inversion of the uterus which occurs with or following parturition is one of the rarest and one of the most formidable complications of obstetric practice. Its occurrence is so rare that it would be well if every case was reported in the hope that some new light might be thrown on this serious accident. The condition was recognized by very early writers, certain causes assigned for its occurrence and various methods described its treatment. While inversion occurs with other conditions, it most frequently follows labor. Out of 400 cases collected by Crosse from the literature, 350 were for parturient inversions. The statistics of several large hospitals as to its frequency are quoted: In the Vienna Maternity Hospital from 1849 to 1878 in more than 250,000 labors there was not a case. In the Dublin Rotunda Hospital one case occurred in 190,000 labors. In St. Petersburg there was not a case among 200,000 births. Winkel had 20,000 labors without a case. The accident occurs perhaps more frequently in private practice for obvious reasons. From the statistics quoted, however, it can be seen that it is a rare occurrence.

Etiology.—The causes usually assigned are varied and have been the subject of considerable difference of opinion among observers. It occurs more often in primipara than in multipara. In most works on obstetrics external violence is given as a factor in the production of inversion. Too firm pressure from above by the vigorous use of Crede's method, or a short cord, precipitate labor, and traction on the cord especially, were given as a cause in a large proportion of the cases. Emmett says that if the latter was so, inversion ought to have been much more frequent in earlier times when the knowledge of obstetrics was considerably less than it is now, but statistics show that the relative frequency of inversion has not changed. Beckman carefully studied 100 cases of inversion and concluded that it occurs most frequently in primipara and young persons, and that violent manipulations rarely play the most important rôle in the etiology; that on the contrary more or less constant conditions existing in the active birth itself bring about the puerperal inversion in the majority of cases. He says that the essential and necessary condition precedent to the origin of a puerperal inversion is the relaxation or flabbiness of the recently emptied uterine body in its upper part and an open os. He concludes that the spontaneous origin of inversion is more frequent than any of the previous writers have supposed.

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Crampton in 1885 studied 226 cases and his conclusions in regard to its occurrence and etiology are as follows:

1. Inversion is preceded by paresis of some portion of the uterine muscle (not necessarily the placental site) caused either by too frequent child bearing, tedious labor, previous miscarriages, traumatism, emotional excitement or too rapid labor; traction on the cord may induce prolapsus, if severe, procidentia. It will never alone produce inversion but may facilitate it if paresis is present. 2. It is more apt to occur in primiparæ. 3. This liability in primiparæ is due to the peculiar emotional excitement preceding and associated with a first labor, reflected upon the exhausted uterine muscles for the first time called into unusual action. Given a slight degree of depression on any portion of the uterine body and the natural rigorous contractions of the uterus in a first labor become a source of increased danger. Adherent placenta is frequently supposed to be a cause of inversion. Athill laid it down as a rule that in cases of inversion following parturition the placenta was invariably found to have been attached to the central portion of the fundus. He comes to the conclusion that fundal attachment of the placenta was not alone the predisposing but was the only cause of inversion. During his long practice extending over fifty years, including ten years residence in the Rotunda Hospital first as Assistant then as Master, he introduced his hand in the uterus many times in cases of retained placenta, many of them very firmly adherent, and in no single case did he find the attachment anywhere except laterally, and in none of them was there the least tendency to inversion. Hennig noted the frequent insertion of the placenta at the fundus in these cases and thought that in partially detached placenta the accumulating weight of blood might favor inversion. Jones of Chicago says that the great predisposing cause is inertia uteri, and that the two chief exciting causes are funic traction and fundal pressure. He concluded that most, if not all, inversions begin at the fundus largely

because this portion of the uterus is exposed to most of the forces which produce inversion especially by external pressure.

A number of cases are on record in which inversion has occurred immediately after coughing and violent straining at stool.

Symptoms.—The symptoms are usually very pronounced, being chiefly those of profound shock, namely fainting, small, rapid and feeble pulse, possibly convulsions, vomiting and a cold, clammy skin. Severe abdominal pains, cramps and bearing down are present. Hemorrhages are a frequent accompaniment, sometimes to a very alarming extent especially if the placenta be partially or entirely detached. The loss of blood depends to some extent on the condition of the uterine walls. If there is much contraction on the part not inverted, the compression on the inverted part may be sufficient to prevent any great loss of blood.

Prognosis.—The condition is almost always serious. The patient may die in a few minutes from severe shock. The mortality is variously given from 50 to 70 per cent. In one series of 109 cases there were 80 deaths, and 72 of these within a few hours after labor. Phillips collected from the English literature 184 cases of acute puerperal inversions, and of these 43 died, 23.4 per cent. In 79 cases in which the uterus was immediately replaced in the presence of marked shock 30 per cent. died. In 23 cases in which it was definitely stated that there was no shock, immediate replacement was followed by recovery in each instance. In eleven cases there was no note as to the presence or absence of shock, immediate replacement was successful in each of these cases. In 17 cases death occurred with uterus unreduced, in many of these the patient had died of shock and hemorrhage before the arrival of the doctor who recorded the case. In 47 cases the uterus was not reduced at once but was allowed to pass into the state of chronic inversion which was treated later in various ways with the recovery of the patient. In two cases death resulted from septic infection, and in two cases the body of the uterus was twisted off by the attendant, yet the patient recovered. Of the 43 deaths, 41 occurred within a few hours. The figures in this series show that immediate replacement is followed by fatal results in 21 per cent. of cases, while cases which were allowed to become chronic, two out of forty-seven died, or 5 per cent.

Treatment.—There seems to be no fixed rule to guide us in regard to treatment. Some authorities advise immediate reduction at any cost with the necessary measures for preventing the recurrence of the accident, the prevention of sepsis, and combating the effects of shock and hemorrhage. Lusk advises delay until there is recovery from shock. Some cases have died after immediate reduction, while others apparently just as serious, have recovered with the uterus left inverted. One important question in the treatment is the management of the placenta in those cases where it is still attached. The removal of the placenta certainly lessens the bulk of the inverted portion and therefore makes reposition easier. On the other hand, if hemorrhage is serious, as is frequently the case, the removal of the placenta may increase materially the loss of blood. But if any delay or difficulty be experienced from the increased bulk no time should be lost, and it would seem better to remove the placenta and reinvert the organ as soon as possible. Cutting operations, although successful in the chronic stages, can hardly aid much in the acute cases during the period of shock.

The following case came under my observation and presents some interesting features.

Mrs. P. F., age thirty-five, born in U. S., family history negative with exception of the fact that one brother is a mental defective and has tuberculosis.

Personal history: Had usual diseases of childhood. Strong and well nourished. No severe or long continued sickness. No specific history. At age of thirty began to have epileptic attacks which occurred about once a month. Received treatment at Craig Colony. During past year attacks have been less frequent, the last one being one month before confinement. Menstrual periods always regular and never had any pelvic trouble. On February 2, 1917, I was called to see the patient, a primipara, early in the morning and found her in labor having characteristic pains at intervals of about ten minutes. Examination showed cervix quite hard and rigid, the os scarcely admitting one finger. Pelvic diameters apparently normal. At this time was unable to make out position. Labor continued with frequent and very hard pains from beginning, the os dilating very slowly and remaining very resistant throughout. About noon an examination showed the os dilated only sufficiently to admit two fingers easily. At this time position was found to be right occipito-posterior. During afternoon labor pains became very hard, patient strained violently with each one. At about six o'clock patient was becoming exhausted and it was decided to deliver with forceps, a procedure which was postponed and reluctantly used on account of the epileptic history. Os sufficiently dilated to admit forceps. Patient placed under anesthetic (ether) and at 6.30 P. M., forceps applied. At about 7.30 child was delivered. There was some laceration of the perineum which was subsequently repaired. When the head was delivered I noticed that the cord was twisted around the neck once, and as the body was born the cord was found to be twisted around the leg. Child was quite cyanotic and it was necessary to clear out the trachea and apply external stimulation by means of cold water to induce respiration.

As the patient was under the anesthetic for some time and the pulse was quite rapid it was decided to express the placenta by Credè's method, but when I placed my hand on the abdomen I was unable to feel the fundus. The placenta was found protruding somewhat through the cervix with the cord attachment directly in the center. On grasping the partially protruded placenta with my hand it yielded very easily and to my surprise it came through the cervix bringing the fundus with it so that the whole mass was entirely outside the vulva. The placenta was completely attached throughout its entire circumference directly in the fundus. The dividing line between the placenta and uterine tissue was difficult to make out. At one point on the circumference I found a small detached spot, and began stripping from this point, which was done without difficulty. The Fallopian tubes could easily be felt through the walls of the inverted uterus, and the orifices were plainly visible. The cervix could be felt like a collar around the lower segment of the uterus. There was very little hemorrhage. I at once grasped the fundus in my hand and began reposition by taxis, and was very much relieved to feel the fundus slip through the cervix leaving my grasp with a quick jerk. Placing my hand inside the uterus I was able to restore the fundus to its normal position. It showed no tendency to recur. Ergot and pituitrin was administered to promote contraction. There was no evidence of shock although the pulse was up to 110 per minute. On the following day there was some abdominal distention and very little soreness over the abdomen. This continued for a few days. Temperature ranged from 100 to 100.5° F. There was no unnatural odor to the lochia and very little soreness over the uterus. Incontinence of urine was present for several days. On the ninth day after delivery patient complained of pain in right leg and examination revealed a beginning phlebitis. About five days later a left-sided phlebitis developed. About two weeks following both sides were cleared up entirely. Patient made a good recovery.

A few days ago an examination of patient showed that involution had taken place completely and the uterus found to be in perfectly normal condition. It is interesting to note in this case the number of predisposing causes that were present to bring about the inversion. We had a relaxed uterus, perhaps increased to some degree by the anesthetic, completely adherent placenta with a perfect fundal attachment, a shortened cord by being twisted about the neck and leg, and a prolonged hard labor terminated by forceps delivery. Apparently the inversion had started simultaneously with the delivery of the child and according to Rokitansky once partial inversion occurs, the uterus seizes the prolapsed portion and endeavors to thrust it out as it would any foreign body. This being so I think that in this case where so many predisposing factors were present that the inversion would probably have been spontaneous had it not been for the anesthetic. Another interesting feature in the case is the absence of any appreciable hemorrhage and no shock. The former I believe due to the perfect attachment of the placenta in its whole circumference, and the latter possibly to the fact that the patient was under the influence of ether.

THE DUCTLESS GLANDS IN GYNECOLOGY.*

BY

S. WYLLIS BANDLER, M. D.,

Prof. of Gynecology, N. Y. Post-Graduate Medical School and Hospital,
New York City.

The influence and action of the endocrine glands are evidenced by somatic, mental and psychic changes. If we can fathom and understand what the ductless glands have done to an individual up to the stage of puberty, we may appreciate why the individual develops as he does. If we can reason out what these ductless glands have done to that individual from puberty on, we may understand why that individual is what he is and why so many changes have occurred in him. If we can eventually fathom what hereditary and accidental and intercurrent factors are responsible for these gland changes and for the consequent somatic, mental and psychic factors, then medicine will have accomplished a glorious work.

You naturally expect to hear a gynecologist make frequent reference to the ovary as a secretory organ, for in many ways the ovary dominates a woman's life both physical and mental. Whatever may be one's opinion concerning the internal secretion or secretions of the ovary, we all acknowledge the ovum to be its external product. Fecundation means the union of a ripe ovum with an active spermatozoon.

It must be mentioned that the germ-cells have been set aside early in the embryonic stage, that each contains the potentials of a new individual who may some day result from the union of one of these ova with a spermatozoon and from the union of the chromosomes of their nuclei.

Mendelism teaches us that the determiners of the traits of the father and the mother are brought together in the offspring. When the male pronucleus has united with the female pronucleus, in each chromosome there is carried the determiners of a number of characters instead of one. Nothing except creation itself is so wonderful as the fact that these microscopic chromosomes contain the potentials which make of the new being, procreated by a union of the male and female pronucleus, an individual who resembles his parents in face or in form or in characteristics; and who develops in himself qualities transmitted from his grandparents and his forefathers.

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In cell division the nuclei break up into segments which are known as chromosomes. Each type of animal has a particular number of chromosomes in the nucleus. Before ripening, the nuclei of the conjugating gametes (ovum and spermatozoon) contain only one-half of the usual number of chromosomes. The chromosomes have united in pairs instead of splitting, and one part of each pair goes into the new ripening daughter cells. In these pairs there is a chromosome of maternal origin and one of paternal origin. This takes place in the halving which occurs at maturation. When the ovum and the spermatozoon unite, the fecundated ovum then contains double this halved number of chromosomes and the usual number is restored (Guyer).

The sex chromosome in the spermatozoon does not divide. The sex chromosome of the ovum does. This sex chromosome in the spermatozoon thus causes an uneven number of chromosomes before halving, hence when maturation takes place some of the new spermatozoa have the sex chromosome and others have not. It is this sex element in the spermatozoon which, when uniting with the female sex chromosome, results in a female child. If the spermatozoon contains no sex chromosome its union with the female sex chromosome results in a male child. It is probable that the sex determiners are associated with this sex chromosome of the spermatozoon.

We know that dominants and recessives determine the character of the new being. This may be illustrated by factors which appeal to any one. For instance, as to the eyes, brown or black are dominant to blue or gray. As to the color of the hair, dark is dominant to light, black is dominant to red. As to the shape of the hair, curly is dominant to straight. As to the skin, dark is dominant to light. As to temperament, nervous is dominant to phlegmatic.

Through the action of the dominants and recessives we find that there may be transmitted color-blindness, hemophilia, myopia, multiple sclerosis, muscular atrophy, ichthyosis, web-finger, albinism, feeble-mindedness, insanity. Among the inherited qualities are musical ability, literary ability, memory, ability in arithmetic, mechanical skill, longevity, handwriting, obesity, muscular strength and many other characteristics (Guyer).

There is no doubt that many a tendency transmitted through generations must depend upon a transmitted stability or instability of one or more of the internal secretory glands' functions. We recognize in innumerable families an instability of the thyroid transmitted through generations. Hemophilia is an excellent example of this transmission by Mendellian law. Dementia precox is another. I myself have so often observed the hereditary nature of hypophysis transmission that I could cite many interesting family histories.

Dercum shows that dementia precox is a recessive transmitted by Mendellian law. In dementia precox there is an affection of the cortex and of the vegetative nervous system. The toxins act on the autonomous and sympathetic system, affecting not only the brain but the circulation, the digestion and the pupillary reaction. This explains the emotion effects, for these are expressions through the sympathetic nervous system. Dercum finds that the internal glands are involved in dementia precox. The sex glands may dominate the picture, the thyroid may be the important element. There may be an involvement of the pituitary or of the thyroid or of the adrenals or of all three of them. Fauser found, in the serum of dementia precox patients, defensive ferments against the sex glands and the cortex. Hence the idea that unchanged gonad proteins enter the blood and cause a lysis of the cortex. He also finds defensive ferments against the thyroid, adrenals and thymus.

Now that we know the important relation existing between the various secretory glands, and among these the ovary and the testicle are not the least important, we can understand that in dementia precox menstruation is delayed or that there is sexual precocity. We can understand the sexual excesses, vagaries and perversions. It is easily understood why the symptoms are brought out or accentuated by menstruation or brought on by pregnancy, repeated pregnancy or by miscarriage. Hence *dementia precox is a serious and extreme type of endocrine aberration or abnormality evidencing its presence by psychic rather than somatic alterations*. So as we delve into one mental aberration after another, the internal secretory glands seem to be more and more related to conditions characterized by psychic manifestations.

The physical and mental development of the individual are dependent on the action and interaction of the ductless glands. The nutrition of the body, of the mind and of the sexual organs, as we are learning more and more, are dependent on the trophic stimuli of the ductless gland system. Long before the trophic relation between the various glands and the ovary is evidenced by menstruation and development of the secondary sex characteristics, these glands are concerned with the body growth.

The physical and mental development of a growing child is dependent upon the activity of the hypophysis gland and particularly the thyroid gland. Bony growth is of course related to calcium metabolism and here the thymus and the parathyroids and adrenals are of importance. The thymus and the parathyroid glands are particularly concerned with calcium matabolism and, to this degree and probably in ways which we do not yet understand, they are intimately associated therefore with bony growth and the development of the skeleton. We do know that hypothymism causes short bones, thin bones, fragile bones. We know the lack of physical and mental development in cretinism. We know that dwarfs may also be due to an underactivity of the hypophysis gland.

In hypopituitarism, if there is a diminished function of the posterior lobe before puberty, and a consequent failure of stimulation of the uterus and ovaries, we have a resulting sexual infantilism and an absence of menstruation. In the type of Froelich we observe a failure of skeletal and sexual development. If hypopituitarism of the posterior lobe occur after adolescence, genital dystrophy results; that is, a *degeneratio adiposogenitalis.*

On the other hand no excessive action of the thyroid will produce a giant, but excessive action of the hypophysis gland, particularly the anterior lobe, does produce normal giants and in excessive cases such giants as we see in the circus.

The adrenals are developed from the same region as the ovary, in fact they both come from what is known in embryology as the genital ridge. The thyroid is distinctly a sex gland, particularly so in the female, as may be recognized from the fact that thyroid diseases are from six to eight times as frequent in the female as in the male.

The attention of everyone is called to the sex activity of the pituitary gland because of the well-known action of pituitrin in labor. Early development of the body with sexual precocity may be due to an involvement of the hypophysis gland, of the adrenals or of the pineal gland or of the testis. Cases of this type with tumor throw a decided light on the relation of these glands in the way of over or underactivity to the physical, mental and sexual development of the growing child. The difference in the skeleton of the female and the male, the difference in the shape of the pelvis, the larger hands and feet in the male show to us that *in the two sexes bony growth must be modified to a certain degree by the action of the ovaries on the one side and the testes on the other side.* Our attention here must be given particularly to the hypophysis gland.

Let us see in what way its activity is modified by the fact that the female has an ovary and the male has the testis. Practically all the glands of the body are concerned in physical development, in the development of the bones and in the mental phase of development.

The physical build and the secondary sex characteristics of the male and the female differ to a decided degree. It is impossible to conceive of two glands so different in their action as the ovaries and the testes without coming quickly to the conclusion that they must modify in a decided degree the relation which the other three glands bear to them, referring here again to the thyroid, the hypophysis and the adrenals. The question may be answered at first hand by the statement that the ovary has an effect on the female and the testis has a specific effect on the male. But their action is in all probability not one exerted entirely per se, but due to an action stimulated or inhibited in the other glands, that is, *the interactivity or activity of the other glands is altered.*

The interstitial cells of Leydig in the testis are intimately concerned with the changes which produce the bony growth and the male secondary sex characteristics. They are related not only to the heavier bone development, the shape of the male pelvis, but also to the growth of hair and beard, the more generous distribution of hair and changes in the voice.

Changes of an entirely different nature occur in the female. We have the smoother skin, the lesser distribution of hair, the absence of hair on the face, the difference in the voice, a more generous layer of fat under the skin, a development of the nates and the typical shape of the female pelvis.

The testis in the male produces such a change in the adrenals, in the pineal and in the hypophysis that by its own action and by its stimulation of these other glands, the characteristic qualities of the male are produced. It seems as if this type of function in the hypophysis were more active in the male than in the female. This gland has much to do with the growth of hair and with the character of the skin and with the bony framework. In other words *the anterior lobe of the hypophysis is more a male than a female gland and the posterior lobe is more a female than a male gland.* So with the thyroid, which is more of a sex gland especially in the female than is generally appreciated. The ovary does not stimulate the anterior hypophysis to the same degree as the testis does. There is less stimulation or a relatively slight inhibiting action on the hypophysis by the ovary which results in a different distribution of hair with lighter and more gracile skeleton, small hands, smooth skin. This speaks for a certain degree of antagonism in this specific phase, between ovary and hypophysis. Another evidence of inhibition seems to be introduced by early ripening of the ovaries.

The thymus gland is suppoesd to have an inhibiting effect on the gonads, preventing their too early development. At the proper time the thymus and the pineal are supposed to regress and the inhibiting influence on the development of the gonads being removed, they come into their function at the normal time and in the proper way. A prolonged action on the part of the thymus inhibits the early development of the gonads; a too early regression of the thymus favors their early function. This action of the pineal and thymus seems to be more pronounced and frequent in the male than in the female.

Early ripening of the ovary often has an effect on skeletal growth, resulting in slighter stature with short legs, whereas late maturation of the ovary results in a larger individual. The relation of the ovary to calcium metabolism may be further observed by the fact that excessive action of the ovaries may abnormally increase the calcium output. The condition known as osteomalacia is to be considered as an example. So far as the ovaries are concerned we are as yet by no means settled as to the various elements contained therein. All the elements of the ovary promote uterine hyperemia. Extract of the interfollicular tissue and of the hilus diminish contractility of the uterine muscle and of all muscle fibers when immersed in these fluids. This extract likewise diminishes the coagulability of the blood. Injection of tissue-juice, experimentally carried out, injures the follicles.

The liquor folliculi, extract of the follicle lining and corpus luteum increase the contractility of uterine muscle and of all muscle fibers when immersed in these fluids. Corpus luteum increases the coagulability of the blood. The injection of corpus luteum into the veins causes thromboses. Corpus luteum dilates the cerebral vessels.

We distinguish the granulosa lutein and the theca lutein. This latter so-called interstitial structure is said to be responsible for the secondary sex characteristics in the female as the interstitial cells of Leydig are said to be responsible for the secondary sex characteristics in the male. If so, this interstitial substance may have an inhibitory effect on the hypophysis anterior lobe. It is claimed by Schäfer and others that menstruation is due to this element of the ovary and not to the follicles or to the corpus luteum. These theca cells are derived from the stroma and not improbably from the interstitial cells (Schäfer). It is claimed by some that the corpus luteum is developed from stroma cells. Others hold that the luteal cells, at least in part, are derived from the epithelium which originally lined the follicle. While all the elements of the ovary promote uterine hyperemia and hyperemia of the external genitalia, there are two hormones in the ovary, one which prevents or diminishes contraction, while the other contracts muscle, excites it or renders it sensitive to contractile stimuli.

The possession by the ovary of hormones having an opposite action is paralleled in the pituitary body which contains hormones having totally different effects on different structures in the body and at least two hormones which are opposite in their effects, as may be seen from the following: Pituitrin comes from pars nervosa and pars intermedia of which the pars nervosa acts upon the blood-vessels. Its action on the blood-vessels is a direct one and not due, as the suprarenals, to a stimulative action on the sympathetic nervous system. While pituitrin contracts the blood-vessels in general, the kidney vessels on the other hand undergo dilatation and the kidney cells themselves are stimulated directly. The diuretic action of the pituitary is not antagonized by atropine. The posterior lobe of the pituitary yields more than one autocoid. A specific hormone affects the secretion of milk, quite possibly the effect upon the uterus is due to another, while there is little doubt that the fall of blood-pressure produced by a second dose of pituitary extract is due to a chalonic agent entirely different from the hormone which causes the initial rise. There is, however, no tachyphylaxis as regards the effects on the uterus. There is no tachyphylaxis as regards its effect upon the kidney. There are two autocoids opposed in their effects which act upon intestinal muscle, one producing inhibition and the other contraction (Schäfer).

Before menstruation develops, however, the shape of the female pelvis is advanced in its development and we have credited to the ovarian secretion in the earlier years *a definite relation to the hypophysis and other glands, of a somewhat inhibitory character as regards the anterior lobe of the latter particularly, compared with the action of these glands when influenced by the testes.* This inhibition is more marked still after menstruation develops. When menstruation develops the corpus luteum for the first time is developing each month, coming into play with other glands, and thus we have a relatively new secretion, a secretion both inhibitory and stimulative to the hypophysis, thrust into the economy. Therefore twelve times each year in normal cases there develops in one ovary or the other, a corpus luteum which is a gland of marked secretory influence. This reacts upon the thyroid and the posterior hypophysis particularly. There is no question in my mind that the posterior lobe of the hypophysis is intimately related to menstruation. *The ovaries themselves and the corpus luteum and the posterior lobe of the pituitary have the trophic control over the well-being of the uterus and the adnexa.* The uterine lining swells each month into the menstrual decidua, producing a secretion which reacts on the ovary. Ovarian secretion and the corpus luteum react upon the decidua. At menstruation blood is thrown off and a stimulus by the posterior lobe of the pituitary is undoubtedly exerted. In all probability many cases of excessive pain and uterine contractions during menstruation resulting in dysmenorrhea are due to excessive activity of the posterior lobe at these menstrual epochs aided by the action of corpus luteum.

It is interesting to note the influence of the premenstrual stage. On questioning patients as to the symptoms by which they recognize the onset of the expected menstruation, one notes that there is no warning in many. In others there is a slight fullness of the breasts, in others a sensation of weight in the pelvis, in others there may be backache, others have slight pains a day or two before menstruation. However, a goodly number of patients note the approach of the next expected menstruation by the onset of nervous symptoms. Some are depressed markedly, others are irritated. Many become so nervous in the few days before menstruation that a marked interglandular instability is certain. They are irritable, restless, cry easily, some are alternately depressed and excited giving rise to what I have termed constitutional dysmenorrhea.

When we realize the influence of the ovarian secretion and the corpus luteum with its tendency to dilate the cerebral vessels, when we take into consideration the swelling of the thyroid with a probability of hyperthyroidism being present in many cases, when we consider that changes take place in the hypophysis gland, particularly the posterior lobe at menstruation, we may realize how a sensitive or unstable relation of these three glands may cause patients to suffer for the few days before each menstruation, and this apart from the distress of dysmenorrhea. *Dysmenorrhea, amenorrhea and* *menorrhagia may be the somatic evidences of endocrine abnormality. Constitutional dysmenorrhea is the psychic evidence of this abnormality or instability.*

Menstruation is a miniature labor, labor is a magnified menstruation The hypophysis reacts at menstruation in the same way that the thyroid does and the posterior lobe particularly is closely concerned with the menstrual function. At full term we have the ovary and the pituitary extract acting again as they do at menstruation after a period of two hundred and eighty days, during which time their menstrual function has been inhibited by the presence in the uterus of the placental gland. At the menopause or change of life period we have a regression of the ovarian function with a coincident alteration, in normal cases, on the part of the thyroid and alterations on the part of the hypophysis.

Since every ductless gland is influenced by hyperactivity or hypoactivity of any of the other glands in the cycle, it can be readily seen why we have instability of gland function so particularly marked in the female. Hence the thyroid and hypophysis are being played upon twelve times each year by the menstrual function. These glands are affected and markedly so by pregnancy and by labor. In pregnancy the anterior lobe of the hypophysis evidences increased activity, the gland finally becoming two or three times the normal size and remaining thereafter always somewhat enlarged.

Since the entire coördination between the glands is often upset at the menopause period we can readily account for the nervous phenomena so frequent in the female; for it requires only a slight study to determine that the thyroid and the hypophysis are very essential to a normal, stable nervous system and normal cerebral activity. If we as gynecologists lay great stress on the importance of ovarian function it is because the function of the ovary, as manifested by menstruation and premenstrual symptoms particularly, is an index to its relation to other glands and to the element of acquired or inherited instability.

In some instances the ovarian instability or hypofunction may be primary, but in very many instances its relation to the thymus, thyroid and the hypophysis is so close that the result is secondary. From whichever point we approach this question, *it may be stated that altered ovarian function as evidenced by menstruation, is an index and an evidence that there is an upset somewhere.*

The thymus acts on the growth of bone as does the thyroid. In underfunction of the thymus the bones are shorter, thinner and more fragile. Early retrogression of the thymus results in large hyperplastic ovaries. Hypoplastic ovaries may indicate a persistent thymus.

The relationship of the thymus to the testis seems to be more marked than the relationship between thymus and ovary. It is possible that in some cases hypoplastic ovaries may be related to the status thymicus where we find the large thymus, the large lymph glands, large tonsils and follicles at the base of the tongue, a narrow aorta and a large pale heart. In this connection it may be mentioned that this type of case is associated with suprarenal insufficiency. The status thymicus is not infrequently associated with Graves' disease and the opinion has been expressed that Graves' disease may represent a hyperthymus state. *Hence the diminished menstruation in many cases of Graves' disease.*

With hypoplasia of the ovaries the uterus develops poorly. Menstruation is diminished, delayed or absent, and the secondary sex characteristics are less well marked. The reproductive function of the female may not be impaired even if sex characteristics are wanting. Trichosis of the male type may be manifest, which again speaks for a removal of the inhibition of the anterior lobe which we have mentioned as one of the functions of the normal ovary.

Infantile uterus, hypoplasia of the uterus and adnexa, poorly developed secondary sex characteristics, late menstruation are an evidence either of primary involvement of the ovaries and genital tract, or a secondary influence exerted upon them by the thyroid, hypophysis, adrenals, thymus or other glands.

Each case must then be studied to determine the primary condition. Whatever condition be the cause, stimulation of the ovaries and of the genital tract by the administration of ovarian extract and corpus luteum is essential whether thyroid or hypophysis be given.

The amenorrhea of lactation associated with lactation atrophy is due to the influence of the mammary gland secretion. The mammary gland under the stimulus of nursing, elaborates the hormone which contracts the uterus and antagonizes corpus luteum; and excessive action of this type associated with amenorrhea, eventually results in an atrophy of the uterus and an inhibition of ovarian function which in the huge majority of cases can be readily overcome by the administration of ovarian extract or corpus luteum particularly if iron, arsenic and thyroid be added.

Chlorosis is so much a disease of the adolescent stage, so almost inevitably found in girls, that the good results of ovarian extract or corpus luteum extract when used here and supplemented with iron and arsenic can be readily appreciated.

A decided atrophy of the uterus which occurs occasionally after a too thorough curettage, can be understood when we realize that the endometrium stimulates the ovary and the ovary stimulates the endometrium; and if too thorough a curetting be done and the stimulation exerted on the ovary and follicles be lost, we get an atrophy of the uterus which in some cases is hard to overcome, particularly if in these cases we have an underfunction of the posterior lobe of the pituitary and its nutritional value is lost or if there is dyspituitarism.

In young women with constantly accumulating obesity there occurs very often a diminution of the ovarian function and menstruation, with an atrophy of the uterus and ovaries which in many cases no method of treatment will overcome. Here we are dealing with various grades of what is known as degeneratio-adiposo-genitalis, a condition due to an underfunctioning of the posterior lobe of the pituitary gland after adolescence. Here the endometrium and ovary lose the stimulus necessary to their activity, the uterus loses the automassage produced by the pituitary gland. In many instances even large doses of ovarian extract or corpus luteum supplemented by hypophysis extract are of little avail. However, in all cases of diminishing menstruation, extract of the ovary is indicated. This may seem very simple as a general proposition but when we analyze it we find it is because the other glands too are affected thereby that this ovarian therapy in the field of nervous and mental diseases is so marked.

In acromegaly, a diminution of ovarian and uterine function, a diminution in menstruation, impotence on the part of the male are so marked that it is almost a temptation to agree with some of the foreign authors that the primary disease is located in the gonads.

If the hypophysis and its diseases act on the ovaries as is the case in acromegaly, hypopituitarism and dyspituitarism, why may not the reverse be true? If the ovaries are affected by the infectious diseases of childhood or by the diseases and infections of adult life, and a hypoovarianism results, why may we not get a lack of inhibition of the anterior lobe and a lack of stimulation of the posterior lobe of the hypophysis? The former would then give us the male type of pelvis, the male form of trichosis, and from this point on the various grades of increased activity of the anterior lobe. The latter would give us the tendency to obesity and the high sugar tolerance and the various gradations of posterior lobe insufficiency.

If the thymus inhibits the ovaries why may not the reverse be true? Then the infectious diseases of childhood or a primary involvement of the ovaries by making them hypoplastic would result in a persistent thymus and a tendency to the status thymicus. If mumps, for instance, may result in an involvement of the testicle, the same effect may be produced unrecognized in the ovaries.

If hyperthyroidism, with or without hyperthymism, is so frequently associated with diminished ovarian function and diminished menstruation, why may not the reverse be true? Why may not ovaries hypoplastic or affected by infections or hypoactive through lack of proper stimulation result in relative hyperfunction of the thyroid with many of the symptoms of Graves' disease minus the exophthalmos and the goitre? Why may not ovaries inefficient as to their secretion, due to lactation or to so-called small cystic degeneration, associated with diminished menstruation cause a condition of relative hyperthyroidism?

In the climacterium, especially with rapid diminution in ovarian function, a state of relative hyperthyroidism is of frequent occurrence. This parallels the important question of primary ovarian involvement after puberty, especially the changes connected with abortion, pregnancy and labor and inflammations. The latter, particularly, results in changes in the tunica albuginea and in the retention of numerous follicle cysts. Ovarian function is disturbed, evidenced somatically most often by excessive menstruation, but often enough by diminished menstruation. With or without such changes we must count on this altered ovarian function, either excessive or diminished, as having a direct connection with those glands most intimately associated with the gonads. The balance of the endocrine cycle may be upset, particularly so in the unstable cases. Instability or lability is thus first brought to our attention. Hence the nature of the interglandular manifestations are various in type and form, conforming to no definite course and picture. The symptoms may be purely somatic. *They are, however, often enough psychic.*

Now we come to the opposite extreme, overactivity on the part of the ovaries, evidenced by menorrhagia or metrorrhagia. Here we find greater difficulty in accomplishing a therapeutic result. Novak finds that corpora lutea with marked development of the paralutein tissue often are associated with excessive menstruation. The degree of uterine bleeding is not related to the amount of lutein tissue found in the respective ovary. Whereas the ovary helps in cases of hyperthyroidism, the thyroid does not do so much for the cases of hyperovarianism. We must look to other glands. The mammary gland extract is an excellent thing in many cases of menorrhagia because of its well-known action as evidenced by lactation atrophy. Nursing tends to inhibit ovulation, the purpose being to avoid menstruation and intercurrent pregnancy. The thyroid helps in some cases of menorrhagia especially in those cases due to an undersecretion, a relative state of myxedema.

Since the thymus is antagonistic to the ovary, it would seem to be of value for ovarian hyperactivity, for overgrown endometrium and for menorrhagia. I note that this extract has received little attention for this indication and yet it has proven in my hands to be exceptionally valuable in the persistent menorrhagia of young girls, when all other drugs or extracts have failed. In the persistent menorrhagia and metrorrhagia which occasionally follows the ideal vaginal operation for prolapse of the uterus it has served me well. In the persistent bleeding associated with fibrosis uteri it is occasionally effective when used in combination with ergot or ergotine.

Recently our attention is being attracted to the value of placental gland extract in cases of menorrhagia and metrorrhagia. Theoretically it would seem to be the proper thing to use, because the moment that pregnancy takes place, the secretion from the outer covering of the ovum inhibits the menstrual stimulus produced by the ovary, corpus luteum and the posterior lobe of the pituitary gland. During pregnancy there is a combined antagonism between the pituitary, ovary and adrenals on the one side and the placenta on the other.

I should like to discuss what I have called . . . *The higher up theory of sterility* . . . I do not want to decry the operation of dilatation of the cervix or discision or any other method of cervical operation for sterility; but I feel that we have spent entirely too much time at this point of attack and have concentrated our thoughts on the area which is not at all responsible in a large proporton of cases.

One might safely say that it is hard to keep a good spermatozoon from passing through the cervix and it is very hard for a poor spermatozoon to pass upward even through a roomy cervix. Spermatozoa pass upward from their own motility, possibly a form of attraction is responsible for this upward movement. The fact is that the ciliated epithelium acts downward and creates a current against which they move, and it is possible that their inclination is to move against the current. They pass out from the uterus into the Fallopian tubes. Anyone who has seen the lumen of a Fallopian tube at the interstitial area, the part passing through the horn of the uterus, knows how extremely narrow this area is. Therefore a spermatozoon that can pass through a Fallopian tube of this sort, ought to be able and ought to pass up through any stenosis of the cervix.

The lining of the uterus may not be adapted to the imbedding of an ovum. Its character may be so altered by secretion or some other condition, that an ovum cannot imbed itself or if it does is expelled very early. We have a large proportion of cases in whom spermatozoa are present, in whom no cervical nor uterine inflammation is to be found.

Granted that the spermatozoa are active and can pass upward, the most essential feature for fecundation is the production by the ovaries of ova capable of fecundation and then of passing into the uterus by the action of the ciliated epithelium of the tubes. It is not generally recognized that the ciliated epithelium of the tubes is and must be under the trophic control of the ovaries, probably of the thyroid and very probably of the pituitary gland. One will be surprised at operation in sterile women and in cases of one child sterility, to see the atrophic state of the Fallopian tubes, slight, thin, deprived of their musculature. In all probability the ciliated epithelium does not act. This condition is undoubtedly responsible in many instances for sterility, especially that type of sterility where patients have for years and years been sterile, and finally with treatment and more frequently without treatment become pregnant.

Associated with this condition, and very frequently they go hand in hand, is a condition in the ovary where ovulation in the strict sense does not take place; that is ova are not thrown out. The ovaries are filled with cysts, the trophic control of the ovaries by the thyroid, particularly by the pituitary gland, is exerted in a sense *but does not stimulate enough or sufficiently* and these Graafian follicles come to a certain point and do not rupture. A very thick tunica albuginea may likewise be responsible for this but the lack of trophic control by the hypophysis is a frequent factor. Loeb found that extirpation of the corpora lutea in the guinea-pig accelerates the bursting of ripe Graafian follicles which indicates that the presence of corpora lutea inhibits ovulation. The corpus luteum of pregnancy inhibits the ripening of follicles. Many ovaries contain these small atresic follicles, they contain corpus luteum rests, occasionally corpus luteum cysts *and thus an inhibition of ovulation takes place.*

Here again we have the cases where as a result of treatment and very often without treatment, or due to a change of air, or scene or often through a prolonged course of travel, the inhibition is removed and ovulation does take place with subsequent pregnancy.

While the corpus luteum is an important factor in menstruation, one must not underestimate the value of the ovary itself. This part may cause regular menstruation and yet ovulation or the ripening of a Graafian follicle for the production of a corpus luteum does not take place.

We next have the large hyperovarian condition consisting of those ovaries known as the oyster ovary. There is a great deal of interstitial tissue and there may be a very slight production of Graafian follicles. These cases not infrequently show the surface studded with small-sized atresic follicles projecting above the surface. In these cases the tunica albuginea is not thickened, ripe ova frequently are not produced or expelled and yet ovarian secretion is present. These cases often menstruate and menstruate excessively. If in cases like these the ovum is thrown out, the corpus luteum is produced and it may be that the ovum does enter the uterus but the stimulative effect of the ovarian secretion, probably aided by the pituitary, overcomes the trophoblast secretion of the ovum when it imbeds itself and so the ovum does not inhibit menstruation and it is thrown off at the regular menstrual period or occasionally a few days later.

So we have the type of sterility due to conditions of the ovaries that are not inflammatory in nature, the hypoovarian type where ovulation does not take place because of ovarian inefficiency, the primary condition often dependent on lack of hypophysis stimulation. We have cases where the ciliated epithelium of the tubes does not act, cases where the tubes are too narrow, either in the sense they have not developed or they have become atrophic afterward. Then we have ovaries with contained atresic follicles, corpus luteum rests or corpus luteum cysts, follicle cysts which inhibit ovulation. We must add the hyperovarian type where imbedding of the ovary does not continue and where repeated probable early casting off of the fecundated ovum takes place. In connection with this study of sterility it is of interest to state the following facts observed in the cow:

In the cow the corpus luteum is about 5/6 inch in diameter. It remains for the 310 days, that is 280 days plus 30 days postpartum. (Metritis and pyometra of abortion, at premature labor or at full term may cause the corpus luteum to remain permanently in the ovary.) If there is no pregnancy, the corpus luteum shrinks to one-fourth of its size twenty days after the estrum, and a new corpus luteum appears in the other ovary. If there is no pregnancy, the corpus luteum may form a corpus luteum cyst which tends to prevent ovulation, but often other corpora lutea form and develop into cysts. Small cysts in the ovary are inimical to breeding but not prohibitive. They may cause nymphomania and a remarkable laxity of the broad ligament. Larger cysts 4 to 8 inches in diameter destroy the ovarian tissue but the other ovary may be normal. Hypertrophied yellow bodies, ovarian corpus luteum cysts if squeezed out are followed by ripening of a corpus luteum in the ovary very quickly.

To repeat: On the one hand we may have primary or secondary involvement of the ovaries with injury to the follicle and interstitial apparatus and diminished or absent menstruation. On the other hand, we may have primary or secondary involvement of the ovaries with no ovulation, and yet menstruation is not diminished or it may be increased.

In the glandular therapy of sterility we administer by mouth ovarin, corpus luteum extract, hypophysis extract, especially posterior lobe, thyroid extract, suprarenal extract. Hypodermatically we administer corpus luteum extract, pituitrin, adrenalin. An excellent combination is pituitrin combined with adrenalin but this must be used in small doses at first for hyperpituitary patients react with too strong doses and evidence pallor, tremor of the hands and occasionally a decided shakiness of the extremities.

The surgical treatment of this form of sterility is of interest. I have had brilliant results in several cases associated with menorrhagia by performing a wedge-shaped excision in both ovaries, thus overcoming the menorrhagia, and removing from each ovary the thickened tunica albuginea and the numerous atresic follicles, corpus luteum rests and occasionally a corpus luteum cyst, all of which elements by their presence and by their inhibitory influence may prevent the bursting of follicles and the liberation of the ovum. These excellent results are not obtained in cystic conditions of the ovary or with thickened tunica albuginea if menstruation is diminished or slight in amount. In these cases care must be taken to split the ovary, remove the cysts and save as much of the ovarian tissue as possible.

A very frequent condition in women is asthenia, a condition particularly noticeable in the postpartum period, persisting in many cases for months and in many cases persisting permanently. The individual is entirely changed, she never regains her former tone, has a laxity of the abdominal muscles, has a gastroenteroptosis;

there is nephroptosis, hysteroptosis and a decided lack of tone in the circulatory apparatus. Some cases suggest a mild form of myasthenia. In the study of the element of asthenia, especially postpartum form, we must take into consideration the fact that during labor the placental gland has been active and that this has a marked effect in a stimulating and inhibiting way on the other secretory glands of the body. Placenta is a new element and it is in constant opposition to the protective glands of the body. The thyroid, ovary, adrenals and pituitary are put to the test, and even if victorious, the thyroid but especially the adrenals and pituitary are exhausted in many instances.

The rôle of the parathyroid must be of importance in pregnancy. The principal rôle of the parathyroids is their control over calcium metabolism. Calcium moderates the activity of the nerve cells. Wiih too great a loss of calcium the patient is in an excitable state. With a diminution of parathyroid secretion, tetany may occur more readily if the subject become pregnant or is injected with placental extract or if she nurse. Hence we should give parathyroid in chorea, in epilepsy, in eclampsia. In Graves' disease the parathyroid is often involved. Excessive action of the parathyroid is supposed to be responsible for myasthenia gravis. The parathyroid to a certain degree restrains the thyroid and since they are antagonistic, we are advised to give parathyroid in Graves' disease but not in myxedema.

The ovary too is related to calcium metabolism, and we have in osteomalacia what may be considered as excessive action. While it has been claimed that osteomalacia is due to the withdrawal by the pregnant uterus of the adrenalin from the osseous tissue, since adrenalin furthers the absorption of calcium by the osseous system, nevertheless 83 per cent. of the cases of osteomalacia are cured by castration. We know that castration causes an increase in growth and in the length of the bones.

Acromegaly and osteomalacia are opposite conditions as regards the ovarian state. While osteomalacia may be benefited by adrenalin, it is benefited more markedly by pituitrin and the pain in the bones and general motility are thereby improved.

The adrenal cortex is enlarged in pregancy. In the early months of pregnancy however there is a diminution of function of the adrenals. Changes occur later in the adrenal cortex cells which give evidence of a secretory alteration. Chloasma uterinum and pigmentation may here find their explanation. The placenta may be responsible for the adrenal action in this particular. The adrenals aid and protect against intoxication. The placenta has in all probability an antagonistic action upon the posterior lobe of the pituitary. It has been antagonized by the other glands of the body, the thyroid and adrenals, for the protection of the system, protecting the body against too great an invasion by the chorionic epithelium, protecting the system against the toxemia of pregnancy.

The balance of the endocrine system has been upset, there is an underfunction of the hypophysis, of the adrenals and of the thyroid postpartum. Hence glands may evidence at endency to fatigue and for that reason the degree of asthenia may be so marked in a patient in whom these glands are not normally over strong, that the resulting condition may last as I have said for months and years.

As regards pregnancy let us say that hydatid mole and chorio-epithelioma are *local somatic evidences of placental aggression.* Let us say that eclampsia is the *systemic evidence of placental aggression* and let us call *puerperal mania and puerperal psychoses the psychic evidences.* Let us call *asthenia postpartum endocrine exhaustion due to placental aggression.*

In many case we may benefit these patients decidedly by the administration of one or other of these glands, with ovarian extract too if that is indicated. Many patients improve quickly while in the others the course of progress is very slow.

In the consideration of asthenia we must remember that the hypophysis has an anterior and a posterior lobe, the anterior lobe being concerned with physical development and physical strength, while the posterior lobe is more intimately concerned with genital function. Hence in asthenia if menstruation be normal the anterior lobe is the more important extract to administer. The relationship of the anterior lobe to various functions is more marked in the male than in the female, accounting for the greater strength of the male. In many women in whom the anterior lobe plays a more than normal part, we have the large body framework and the great strength. If there be no coördinate activity of the posterior lobe, there is either a diminished development of the genitalia or the diminished tendency to feminism. With these facts in mind we may realize the stimulative action of anterior lobe extract in asthenia. Blood pressure in these cases may be extremely low. Indications for the administration of suprarenal extract and pituitary extract for long periods is decided. I have a strong suspicion that the anterior and posterior lobes are antagonistic as regards their action on the female genitalia. Hence in giving anterior lobe extract in cases of diminished menstruation, posterior lobe extract and corpus luteum should likewise be given.

We must not in our zeal for endocrinology overlook the essentials of medical treatment. Iron, arsenic, overfeeding, baths, massage and other medical measures are of the greatest importance, and the action of many of these methods is probably directed to the stimulation which is exerted not only on the system in general, but on the blood-forming function and the secretory function of the various glands to which we have just referred.

Thyroid hyperfunction of the extreme type known as Graves' disease, thyroid hypofunction of the extreme type known as myxedema, are associated with anomalies of menstruation. Between the excessive type known as Graves' disease on the one hand and myxedema on the other, there are innumerable gradations from the extreme down to the types which are scarcely recognized. And here again we may have anomalies of menstruation.

Whatever we may find to be the ultimate primary causes of exophthalmic goiter on the one hand and myxedema on the other, the fact remains that thyroid diseases are six to eight times more frequent in the female than in the male. This again proves the element of instability. This is a point to remember, *that of about three thousand cases of Basedow's disease only one hundred and eighty-five developed before sixteen.*

When we consider the nervous and digestive symptoms of exophthalmic goiter and the mental upset associated with this condition, and the metabolic changes and physical and mental lack of tone and energy in myxedema, we perceive that in these extreme types and in innumerable gradations down to the slightest forms, we may include thousands and thousands of patients suffering from hyperthyroidism, or hypothyroidism with the innumerable variations in the symptoms, *the majority of which have been considered in times past as hysterical or neurasthenic.*

The first truth to be recognized in the study of the Endocrine System is that an upset in any one gland has an effect on the whole cycle, causing overactivity or underactivity of one or more or of all or of many. This introduces all the various changes belonging to hypersecretion and hyposecretion of the other glands, particularly the adrenals, hypohysis, thyroid and ovary. The triangle of thyroid, adrenals and pancreas is well known. The adrenals are intimately associated with the pancreas, the pancreas is intimately associated with digestion, sugar metabolism and the liver function. Hence a thyroid affection, either hypersecretion or hyposecretion, acts through the adrenals on the pancreas itself, and through these three organs there is a change in metabolism and liver function. Besides thyroid stimulates peristalsis and intestinal secretion. Hence the innumerable digestive annoyances associated with hyperthyroidism particularly.

Then we know of the relationship between the hypophysis on the one hand and the thyroid on the other with the well known advantages of giving hypophysis extract in cases of hyperthyroidism.

The pituitary cannot take the place of the thyroid in animals affected with cachexia thyreopriva, nor is pituitary extract able to take the place of thyroid extract in the treatment of goiter and myxedema. There is no evidence that these two organs act vicariously. The effect of their injection is entirely different, but they do have a certain similarity of function in relation to growth and development (Schäfer). So that the variations in the symptoms occurring in hyperthyroidism or in hypothyroidism associated more or less directly with ovarian function, produce a mixture and a confusion of symptoms which in many cases take weeks or months of observation to decipher and to definitely correct.

At the climacteric period we are confronted with a supposedly normal waning of the ovarian function associated with which there should be a very gradual progressive diminution of thyroid activity. The relationship between the ovaries and the thyroid and the other glands of internal secretion, at this period, is extremely unstable which accounts for the numerous annoyances from which women suffer. I refer not only to the flashes or flushes supposed to be typical of the menopause, but to the psychic and nervous manifestations so frequently observed at this period.

We distinguish during the climacterium and the menopause stage, three alterations in the activity of the thyroid gland. One a more or less continuous hyperactivity of the thyroid, the second a more or less underactivity of the thyroid, the third such a marked instability of the gland that at times hyperthyroidism is evident and at other times hypothyroidism is evident. Therefore in the first type we have the overexcitable type, in the second we have the depressed type, in the third we have the type alternating between the one and the other, ofttimes suggesting the manic-depressive type of insanity. Here again we have an involvement of the other glands. We may have an overactivity of the anterior lobe of the hypophysis inasmuch as the inhibition by the ovary is removed. Hence the trichosis and the other evidence of anterior lobe overactivity. We may have an alteration often enough in the posterior lobe, a diminution of its activity leading to obesity and a high sugar tolerance.

If we have an overactivity in the anterior or posterior lobe, that accounts for the increased tendency to sugar at these stages, lasting for various periods or even continuous and permanent. Then come the variations in the adrenal function giving us the hypoadrenal type, the low blood pressure type, and the hyperadrenal type, the high blood pressure type so frequently encountered at this period without evidence of kidney involvement. With low pressure hypopituitarism is to be considered. With high pressure excessive action of the posterior lobe.

With hypopituitarism we have the subnormal temperature, slow pulse and low blood pressure, with drowsiness and dullness.

The various alterations in these three or four glands produce innumerable combinations of symptoms and explain the variability of symptoms even in the same patient on various days, weeks and months.

Since thyroidectomy results in growth of the pituitary gland, especially the anterior part, it is probable that this may occur too in hypothyroidism and the myxedematous forms.

The pituitary and the suprarenal are closely related and we know that an injection of adrenalin markedly increases the efficacy of pituitrin and *vice versa.*

The posterior lobe extract stimulates the flow of cerebrospinal fluid. The secretion of the posterior lobe is excited by duodenal extract if injected into the circulation which causes its hormones to be thrown out in increased degree into the cerebrospinal fluid.

The pituitary and the suprarenals are associated functionally with the pancreas and the liver. The thyroid is likewise concerned with carbohydrate metabolism and hypothyroidism is associated with increased sugar tolerance.

Since hypothyroidism may be associated with increased activity of the posterior pituitary lobe, the high sugar tolerance of the former may be nullified. If both thyroid and posterior lobe are deficient there must be a markedly increased sugar tolerance. If both thyroid secretion and posterior lobe are increased there is an increased tendency to the opposite condition. Hence an altered relation in the secretions of the thyroid, pituitary and adrenals may, owing to their relation to the pancreas and the liver, markedly influence sugar tolerance and thus bear a close connection with diabetes mellitus or diabetes insipidus. Adiposity due entirely to posterior lobe insufficiency, hence, may evidence no polyuria or glycosuria. Earnest claims are made, however, that hypopituitarism is the cause of polyuria and diabetes insipidus. In this connection it may be mentioned that in acromegaly in the active stage of oversecretion 30 to 50 per cent. evidence glycosuria. If anterior lobe growth or hyperactivity interferes with activity of the posterior lobe or if hypersecretion of anterior lobe is followed by a state of exhaustion of the gland and the posterior lobe is also diminished in function, then high sugar tolerance eventually follows in acromegaly

With the hypothyroid type we have the slow pulse, with the hyperthyroid type we have the rapid pulse and various types of tachycardia.

With the adrenal involvement we have the normal blood pressure, the low blood pressure or the high blood pressure. We may have the types that are extremely adipose evidencing here both the thyroid type and the hypophysis type.

With the hypothyroidism we may have a lack of proper stimulation to the metabolic processes, giving us the thin patient whereas we ordinarily think that a diminished metabolism gives us the stout patient.

In the hyperthyroid type we have the excessive metabolism giving us in many cases a thin patient unless there is associated with this a hypoactivity of the posterior lobe which then again introduces the phase of obesity and the high sugar tolerance.

So we have to rely for our diagnosis of these cases on their psychic manifestations, their nervous irritability, the pulse-rate, the blood pressure, presence or absence of sugar in the urine, high or low sugar tolerance, trichosis, obesity, tremor, etc.

The administration of the various gland extracts gives us in many cases the key to the situation. The hyperthyroid type is readily recognized by the effect of thyroid. Hyperpituitarism (post.) may be disclosed by a hypodermic of pituitrin. The low-pressure type is readily recognized by the effect of adrenalin, suprarenal and pituitary extract, and in many cases a combination of the three is necessary. Ovarian and corpus luteum for the flushes are in many cases specific in effect. Here again we must not fail to consider the value of other methods as diet, baths, massage, bromides, hypnotics and the various sedatives.

Just as severe premenstrual symptoms speak for a poorly balanced endocrine system, so a severe menopause experience speaks for the same and a placid climacterium denotes a well-balanced interglandular relation.

Like changes of lesser degree between the glands may occur in women at any period and often in the years preceding the climacterium. Unfortunately, in many of these cases menstruation is not affected. If it were, our attention then would be attracted more readily. A slow pulse in a patient always calls my attention to an underaction on the part of the thyroid or to an underaction on the part of the hypophysis. A rapid pulse not even faster than 90 or 100 always calls my attention to a condition of hyperthyroidism.

The excessive irritability of some patients, their nervousness, their instability, should call our attention to anomalies of the secretory apparatus in the thyroid or the hypophysis. In overactivity of the hypophysis we have the temperamental changes such as lack of concentration, feeling of distress, indecision and irritability. The opposite is seen in dulness, indecision, lack of energy, tendency to melancholia, poor memory and the blues pointing to an underactivity on the part of the hypophysis gland.

In early underactivity of the pituitary we have hypotrichosis, little axillary and pubic hair, the sexual apparatus develops poorly or becomes atrophic, the skin is smooth or rough but dry, there are often polyuria and a high sugar tolerance. There may be subnormal temperature and slow pulse. There is also a frequent combination of psychoses, nervous conditions and even epilepsy has been noted. In many cases of goiter the hypophysis is found affected Whatever chemical factors cause the hypophysis to become hyperplastic the same factors act upon the thyroid. Almost all the hypophysis cases are eventually deficient even if the condition is hyperplastic at first. So practically all the typical hypophysis cases of Cushing showed a thyroid deficiency.

Hence I have found it of extreme value to administer corpus luteum and ovarian extract in large doses by mouth and by needle in cases of hyperthyroidism. Pituitary extract and pituitrin are often of great aid. Corpus luteum may diminish blood pressure and dilate peripheral vessels. I am astonished that in this condition the value of these extracts is not more generally recognized. The value of thyroid in the cases of myxedema and in the ofttimes unrecognized cases of underactivity of the thyroid is so marked that no one can mistake the value of this therapy.

Thyroid extract is of great value too as a diagnostic aid, for not infrequently in certain puzzling cases we get an aggravation of the symptoms, an increased irritability and an increasedly rapid heart, and we know that we are dealing with a sensitive thyroid and not a hyposecretion.

Undoubtedly the greatest difficulty in the proper interpretation of interglandular upset, depends upon the fact that so many of them are of minor degree, of a degree less than is typical of the well exemplified cases.

If we have exophthalmic goiter on the one hand and myxedema on the other; gigantism or acromegaly on the one side, certain types of dwarfs or dystrophia adiposogenitalis on the other side; if we have tetany and paralysis agitans on the one hand, and myasthenia gravis on the other; if we have excessive sexual and physical development due to tumors of the pineal, the hypophysis and the adrenals and testis on the one hand and cases of undeveloped genitalia and infantile uterus on the other; if we have acromegaly on the one hand and osteomalacia on the other; if we have excessive function and menstruation through oyster ovaries on the one hand and diminished function and relative amenorrhea through ovarian hypoplasia and degeneratio-adiposo-genitalis on the other; if we have the extreme adrenal disease known as Addison's disease; *why may we not expect minor degrees of involvement in the glands or pluriglands responsible for these major cases, the resulting symptoms here often lacking the typical ear-marks which define the standard types of which we have made mention?*

If instability of gland function is transmitted we have a new basis for predicating the various types of abnormality which may be inherited. Inherited instability of the thyroid may lead in the progeny to either myxedema or to exophthalmic goiter or to variations between these extremes. Inherited instability of the hypophysis may lead to small stature or to large growth, or to simply the psychic manifestations of dyspituitarism. *So that one member of a family may inherit from his parents or grandparents these somatic changes due to gland anomalies or one may inherit the nervous tendencies or the instability of the nervous system or psychoses resulting from anomalies of the internal gland secretions.*

A transmitted instability of internal gland secretion may not manifest itself until some exciting cause appears, and if no exciting causes eventuate the condition may not be recognized as an instability. Certain individuals are more susceptible to involvements produced by any of the inflammatory or infectious diseases. Status thymicus may give no warning until anesthesia or drowning bring the concealed condition to the surface. Pregnancy and labor may be the first factors to bring out the lack of resistance of asthenia universalis.

We must distinguish between the somatic and the mental or psychic side of pathological states due to the endocrine relation. I have seen in so many of my patients attacks of mental depression and blues, so many cases of excitement and states of exaltation of minor degree, so many cases where the states vary from slight exaltation to slight depression without apparent cause, cases after labor with depression of a mild melancholic type, that long ago I came to the conclusion that we must grant variations in intensity in mental diseases.

If we have the forms known as manic-depressive insanity, dementia precox, melancholia, etc., why may we not have minor types of the same conditions confronting us in our gynecological and obstetric work? We know the excitability associated with the various grades of hyperthyroidism, we know the mental apathy associated with the various degrees of myxedema, we know the mental peculiarities and the changes in character in patients with hypophysis alterations. *All these variations noted from time to time in my experience have convinced me that mental diseases of extreme type may have the same relation to the milder form and to the so-called neuroses and psychoses, and to the so-called neurasthenia and hysteria, that the major forms of exophthalmic goiter and myxedema, gigantism and dwarfism, etc., bear to minor variations noted every day in our experience.*

We note in epidemics varying degrees of virulence in successive ravages. We have all degrees of eclampsia and toxemia of pregnancy, those who die in spite of all treatment and the forms which recover practically without treatment. We have variations in intellectual ability from the brightest to the average down to the mental deficients and the mental defectives. The recognition of the moron of the various grades is in itself a fascinating study.

Action of the endocrine glands of an unusual nature may manifest itself entirely in body and physical changes. In another class there may be body changes and psychic or mental alterations combined. In a large class however the alterations are psychic, the physical changes being of such a minute degree that they give no clue to the involvement of the glands. Here in all probability a marked pluriglandular upset is at fault. It is the absence of physical changes in this class of mental diseases that has probably made it so difficult for physicians and the leading neurologists to eventually come to conclusion that the ductless glands are responsible for these conditions. I had the pleasure of seeing recently a case of muscular dystrophy in a boy of fifteen. A first glance was sufficient to show me the acromegalic condition. The head was huge, the forehead large, the chin prominent out of all proportion to the body size and age of the boy.

Since in other cases of this disease, the somatic changes may be diminished or absent, we may fail for that reason to consider the endocrine glands as responsible. Why in one family or in one individual the body is changed, in another the mind and psyche, in another both, is hard to tell. That is a problem for the future. Even in other diseases the same problem holds. Syphilis may affect the bones, the skin, the testes or the nervous system. It is an old observation that if syphilis in the tertiary stage affects the bones or the testes or skin, for instance, the nervous system is rarely involved. On the other hand, paresis or locomotor ataxia occur in individuals in whom there are no other somatic evidences and in whom the primary lesion was not followed by marked skin lesions. There must be in some individuals a marked protective influence over the cerebrospinal structures and it is prefectly possible that among other glands hypophysis may be one of these protective glands.

I may say that we must come to the conclusion eventually that all the physical and mental states depending upon endocrine pathology will be found to have innumerable variations from the forms known as types, to the slightest degrees of variations, including those forms considered as neurasthenia and hysteria, in the vast majority of cases erroneously so. It is these observations repeated time and again in my experience which have made me so hostile to the diagnosis of reflex in gynecology. Those innumerable states of body and mental function formerly considered to be caused through reflex channels by cervical erosions, lacerations of the cervix, deviations in the position of the uterus, prolapse of the ovaries, etc., all these have for years been treated by me on the basis of endocrine pathology and justly so and most successfully. Most of us recall the furor of operation for movable kidney for the purpose of curing by this step innumerable physical and psychic symptoms. To-day this procedure for this purpose is practically a memory.

In bringing out the latent weakness due to hereditary transmission or congenital weakness, the accidents of life also come into play in their effects upon the internal glands. Every infection must play a part, the diseases of childhood, typhoid fever, pneumonia, tonsillitis, influenza, pelvic infections play their part in exerting deleterious influence on the protective glands of the body, among which the glands of internal secretion are the most important. Mental states must be likewise taken into consideration. We know the action of fear and anger on the thyroid and the vegetative nervous system. Long-continued grief, disappointment, abnormal sexual practices, unhappiness, excessive mental exertion, shock have a direct or indirect influence on the internal secretory glands. Onanism, coitus interruptus, sexual longings, etc., must not be given a minor place in this etiology.

Who knows but that circulatory disturbances or the action of as yet uncharted cerebral areas act upon the glands of internal secretion and are acted upon by them and the hormones of which there are probably many more in every gland than we now realize. It is in the hope that the severer forms of endocrine upset may yield to new methods that I make the observations which now follow.

Cerebral activity as such is not only influenced by the secretory glands but probably exerts an influence on them. Tumors even if not connected with the hypophysis, and varying degrees of hydrocephalus, influence the secretory activity of the hypophysis gland. The posterior lobe is connected with the cerebrospinal fluid. It seems inconceivable that this gland should have been placed in this position, its relation to the cerebral structures so close, without its having a marked nutritional and protective value on these structures. Hence we shall understand some day more than to-day, the relation of secretory anomalies of this gland to cerebrospinal conditions, pressures and the psychic states.

It is possible that the cortex or that the nervous system is attacked in those individuals in whom there is a lack of protective power on the part of the pars nervosa for instance over the cerebrospinal structures. Who knows but that the hypophysis secretion may have an important action in this respect. A lack of it may predispose to involvement of the cerebrospinal organs. We have in chorea a cortical condition which is often produced by what is known as a rheumatic infection, not infrequently associated subsequently with endocarditis. We may take it for granted that this rheumatic infection affects one or more of the ductless glands, parathyroid or hypophysis for instance, producing the symptoms of chorea associated w th which, of course, may be an involvement of the circulatory structures by the infection itself only if the patient have an endocarditis.

Let us call to mind the work of Goodman in treating cases of chorea. Here a certain amount of blood is taken from the child, the blood is centrifuged and this serum is injected into the spinal canal after the same amount has been removed by spinal puncture. In one-half of these cases the patients lost their chorea in a few days, of the remainder more than half lost it after a second or third injection.

Goodman finds that only a small percentage of children with chorea have endocarditis. He estimates it in his experience to be

7 to 10 per cent. Others estimate it as high as 20 to 25 per cent., this possibly holding for the acute cases or the severe cases which come into hospital service.

Personally, I have considered the connection between the infection (rheumatic or otherwise) and chorea perhaps to exist through the medium of the endocrine glands. It is possible that in some cases an infectious agent involves some of the glands, for instance the hypophysis or more particularly the parathyroids. Parathyroid has been used in chorea, tetany, epilepsy and eclampsia. In Goodman's experience if a serum derived from the blood of one choreic patient is injected into the spinal canal of another patient, no effect is observed. Only a cure and benefit are obtained if the autoserum is used. This speaks against an infection as the total factor in chorea, even in these so-called rheumatic forms. If the parathyroid is one of the glands involved in chorea and if other glands are also concerned in the condition we might then readily understand why the autoserum only of the patient acts when injected into the spinal canal. In other words, with endocrine pathology only the serum of the patient himself, whatever the nature of the upset may be, should act as an antibody when injected into the cerebrospinal canal.

According to Grey the cells of the choroid plexus are granular cells the activity of which regulates the composition of the cerebrospinal fluid contained in the cerebral ventricles and in the central canal of the spinal cord. The cerebrospinal fluid thus formed returns to the blood by the perivascular sheaths, the lymphatic paths and the bloodvessels of the dura mater. Thus it might be said that "the choroid plexuses are glands of external secretion but having an internal destiny." This calls to mind the possibility of endocrine hormonic changes which may affect the cells of the choroid plexus or the return paths and may thus account for the entrance of toxic substances and their inability to be excreted.

On reading Dercum's observations concerning dementia precox the thought occurred to me that possibly the same method of treatment might be advisable here, namely to withdraw blood from the system and inject a serum into the cerebrospinal canal after removal of a certain amount of the fluid. Dercum states that while no treatment of this sort to his knowledge has been attempted, he has noticed that the withdrawal of cerebrospinal fluid had improved some of these cases notably. In all mental diseases in which the cortex is involved, or cortical centers, it may be found that this line of treatment might be of value on the theory that while in the blood toxins and antitoxins are produced, the toxins only have an effect on the cerebrospinal structures, the antitoxins not finding entrance thereto or not in sufficient power. On the other hand, it may be that the toxins enter the cerebrospinal canal but any antitoxins there formed are insufficient or not formed at all. Spinal puncture removes these toxic products and if antitoxins are produced in the general system as one would expect, if the ductless glands are concerned with the production of toxins, then injection of the same into the cerebrospinal canal would produce a beneficial result. It may be that in normal individuals toxins and antitoxins enter and leave the cerebrospinal canal and that when this mechanism of exchange is affected whereby toxins enter and cannot be excreted, and when the antitoxins in the blood cannot enter or are introduced in insufficient quantity, that we then have the resulting mental and psychic alterations which may perhaps be cured by spinal puncture and its replacement by the antibodies in the autoserum.

Every man interested in any particular specialty may at any time fix his attention on any one gland of the body. To begin the study of any one gland, one must study the relation of the other glands to it, in the trophic sense or in the inhibitory sense. We must study the value of any one gland diagrammatically so to speak. We must put above it, in a stream of thought or on paper, those glands which inhibit it; we must put under it in a stream of thought or on paper those glands which support it.

When that one gland in which we are interested shows anomalies, we must look and see what glands are failing in their support and which glands are overacting or underacting in a secretory way. This leads us into a maze of combinations which require much study in many individual cases to unravel and to help. It is needless to say that many of these gland anomalies can be helped only by surgical means. Graves' disease is the finest example. The beneficial effects of operation on exophthalmic goiter are well known. Cushing has shown us the value of operations on the hypophysis gland, where pressure symptoms are the important thing. Hyperovarianism with persistent menorrhagia is another. I have cured several cases of persistent menorrhagia and metrorrhagia by resection of part of each ovary. Some cases of sterility come into the surgical class by resection of half of each ovary in those cases of sterility when menstruation is normal or excessive and yet ovulation seems not to take place. Osteomalacia is another condition corrected in the majority of instances by surgical means.

I have attempted to review the elements of the internal secretory glands in gynecology from the broader standpoint of the physician. Our concern is to understand the underactivity of certain glands and to support them by administering to the patient substances which are insufficient, and by attempting to inhibit those glands whose functions for the moment are hyper. Do not think because I have praised so much the value of ovarian extract and corpus luteum that I think the ovarian function dominates the whole cycle. Practically speaking, the thyroid and ovarian and hypophysis extracts have proved their very great value in gynecology. It is simply because faulty ovarian function shows us that there is an upset in the cycle that we lay so much stress on the ovaries and the restoration of proper secretory activity, hoping thereby to restore a normal balance when pluriglandular complications are in evidence. Eventually we shall find and differentiate the numerous hormones in every gland in the endocrine system. We shall find that many of them have a somewhat similar relation to physical and mental growth, but we shall eventually discover the selective action of the various hormones.

I have no doubt that just as in poliomyelitis, chorea and syphilis certain areas are affected by selection by the toxic products of the infection, so the various hormones both in health and disease manifest the selective influence of the endocrine glands. That innumerable variations must result dependent on interglandular relations and the congenital physical and mental characteristics of the individual is a rational conclusion.

Let me conclude this address with the opening paragraph:

If we can fathom and understand what the ductless glands have done to an individual up to the stage of puberty, we may appreciate why the individual develops as he does. If we can reason out what those ductless glands have done to that individual from puberty on, we may understand why that individual is what he is and why so many changes have occurred in him. If we can eventually fathom what hereditary and accidental and intercurrent factors are responsible for these gland changes and for the consequent somatic, mental and psychic factors, *then medicine will have accomplished a glorious work.*

134 West Eighty-seventh Street.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Meeting of Thursday, May 3, 1917.

The President, DR. FRANK C. HAMMOND, *in the Chair.*

The following papers were read:

PUERPERAL SEPTICEMIA.*

BY DR. WILMER KRUSEN.

MATERNITY INSURANCE.†

BY DR. LOUIS LEHRFELD.

OBSTETRIC PROBLEMS AND THE CORONER'S OFFICE.‡

BY DR. WILLIAM S. WADSWORTH.

PRENATAL CARE.§

BY DR. FLORENCE C. CHILD.

STILLBIRTHS AND INJURIES AT BIRTH.||

BY DR. CHARLES S. MILLER.

DISCUSSION.

DR. RICHARD C. NORRIS.—The statistics presented prove that the mortality of puerperal septicemia has not been reduced in the hands of midwives and general practitioners sufficiently to make us satisfied with the results. Dr. Wadsworth's paper covers such a wide range of subjects that I would rather read the paper before attempting to discuss it. Some of the problems presented by him are very difficult; to ask and expect an explanation of why cells behave in an ordinary normal way is as much of

* For original article see page 605.

† For original article see page 636.

‡ For original article see page 622.

§ For original article see page 631.

|| For original article see page 615.

a problem as that of why some people have cancer and others do not. Prenatal care, is a very commendable effort on the part of our social service workers. Can we by prenatal care overcome the laws of inheritance? The limitations of prenatal care must be borne in mind. When we have taught by advice the prevention of miscarriages and of toxemia we have done pretty much all we can. The statistical study of premature births teaches us very little. Statistics gathered by men whose standards vary, give a final result of very little value to us. I do know, paralleling my hospital experience with the city statistics, that while the percentage of stillborn children remains just the same outside as well as inside the hospital, the stillborn record of children born at term under an improved obstetric environment shows a marked reduction. I found in a large series of cases that the percentage was just half. The analysis of that group covered nearly 2000 deliveries and showed that the reduction of one-half in the number of stillbirths was due to the fact that the babies were born under good obstetric environment. The only way we can improve the infantile death rate at term is to improve the character of the obstetric work. We should not let sentiment run away with us, and we should not try to accomplish the impossible in prenatal instructions. We should be as practical as possible and remember that the more important thing for social service is the problem of better care of infants and children after they are born. The prevention of puerperal septicemia is a matter of education and can be consummated only by the profession and the midwives giving the proper emphasis and attention to the details of surgical cleanliness.

Dr. Edward A. Schumann.—Dr. Miller divides his cases into abortion, miscarriage and premature labor. I believe that the majority of obstetric writers have abandoned the use of the word, miscarriage, which means nothing, and is applied to an indefinite period between conception and viability. It seems to me that the first function that is developed in an infant after birth which is incompatible with extrauterine life is respiration. I do not think that life in the new-born should be estimated by cardiac activity but by its respiration. I firmly believe that a close study of the history and treatment of all pregnancies, the results of which are abnormal children, will show that the course of such pregnancies in some way is different from the normal. A study of the history of all pregnancies would lead us to a certain degree of knowledge of the pathology of the fetus which is so necessary before any treatment directed toward the welfare of the fetus can be instituted.

Dr. Miller.—It would seem that we must keep our statistics and yet that we must pay no attention to them. The question is one requiring close and systematic work. The mortality from puerperal sepsis in the practice of Dr. Norris and men of his experience would probably be very small. It would undoubtedly be a matter of money value to the city to have an expert visit maternity patients before delivery and see that they had proper care as is done in the case of infectious disease. Dr. Wadsworth's paper opens a large field for study and investigation which might well be taken up by young men.

DR. JOHN A. MCGLINN.—The subject is so broad that it is difficult to discuss it in its entirety. I appreciate the work done by the Department of Health and feel that one reason it has not borne the fruit it should is that the people of the country do not realize the importance of public health work. Only 60 per cent. of the entire community is covered by the Pennsylvania registration area. There is no way by which those who make the reports are able to check them up and so we are dealing with statistics of no particular value. To say that a certain number of women died of puerperal fever means nothing at all unless you know how many women of different nationality give birth to children. The difference in the death rate from puerperal fever in 1911 and 1912 was not due apparently to the fact that obstetrics were better in 1911 but to the failure to report the cases.

DR. KRUSEN, closing.—By having a physician at the head of the Bureau of Vital Statistics we hope to make this Bureau something more than a department for the keeping of figures. If we can stimulate sufficient interest that men will report cases of puerperal sepsis and abortion there may be a time when an analysis of these figures will be of benefit to the medical profession in the saving of life. Statistics may be interpreted in many different ways, but if they were eliminated, where would we be? The Department admits very cheerfully its own limitations. We also appreciate the difficulty presented in the statement of Dr. McGlinn in regard to the number of mothers of certain nationalities born in America. The higher number of cases of puerperal sepsis in 1916 than in 1912 is possibly accounted for by failure of physicians to report their cases which according to the laws of the city and of the State they are required to do. I speak to this medical body as to a group of experts; we come to you for advice concerning the condition and the remedy. I am sorry that the subject of maternity insurance has not been discussed. A Bill has been introduced at Harrisburg asking an appropriation of $5000, for the appointment and expenses of a commission to investigate the question of health insurance. If health insurance is coming, the medical profession should have a word in the formulation of the law. As has been stated maternity insurance now exists in four States. Married women are obliged to stop work for a certain period before and after delivery. Many physicians have been dissatisfied with the Workmen's Compensation Law. It is, therefore, obvious that they should give attention to the proposed health insurance.

DR. LEHRFELD, closing.—If every mother were insured, thereby being entitled to hospital care we should have the opportunity of securing better statistics. Through health insurance laws we would be able to improve our vital statistics.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Annual Meeting, Pittsburg, May, 1917.

(Continued from September Number.)

SYMPOSIUM ON THE RELATION OF THE GLANDS OF INTERNAL SECRETION TO GYNECOLOGY AND OBSTETRICS.

OFFICIAL REPORTS OF THE REFERATS.

INTRODUCTORY REMARKS.

Dr. Robert T. Frank, of New York City, stated that the reason for concentrating mainly upon the physiological aspect was twofold. First, in this subject, even more than in most others, a solid experimental foundation was essential: second, a mere experience meeting would be of little lasting value, and, at least, part of the clinical data properly belonged to the discussion which was to follow the reading of the papers. Consequently it was considered advisable to assemble in easily accessible form facts, some new, others scattered in the literature, which were most important in the further study of the subject and which promised later to prove most valuable when applied to practical gynecology and obstetrics. It proved impossible to enlist authors to present the clinical aspects of such important glands as the thyroid and adrenals.

In order to introduce the discussion, it had been deemed advisable to present in most condensed form the various outlines of the contents of the referats. The authors present would do this for their own papers, the committee undertaking the presentation for the absentees.

THE RELATION OF THE PITUITARY GLAND TO THE FEMALE GENERATIVE ORGANS; FROM THE EXPERIMENTAL AND CLINICAL ASPECTS.

Dr. Emil Goetsch, of Baltimore, drew the following conclusions: "1. There is a close interrelationship in function between the pituitary and sex glands, a fact supported by abundant experimental evidence and by numerous observations on pituitary disturbances in the human subject. 2. Overfunction of the pituitary anterior lobe is associated with overactivity of the sex glands. 3. Deficiency of pituitary secretion in the individual is followed by underdevelopment and genital aplasia in the young and by sexual inactivity and retrogression in the adult. 4. Primary alterations in the function of the sex glands, as in pregnancy and after castration, are followed by pituitary hypertrophy and hyperplasia. 5. The specific action of posterior lobe extract (pituitrin, pituitary liquid) upon the smooth musculature of the uterus and bowel had led to the wide usage of this drug in obstetrical practice and in the treatment of intestinal paresis following abdominal and pelvis operations. 6. The administration of pituitary extracts was of distinct benefit in clinical states of pituitary underfunction."

THE PINEAL GLAND INFLUENCE UPON GROWTH AND DIFFERENTIATION, WITH PARTICULAR REFERENCE TO ITS INFLUENCE UPON PRENATAL DEVELOPMENT.

Dr. Carey Pratt McCord, of Detroit, Michigan, said that from the lack of unanimity in the literature any conclusions as to the details of pineal gland function must be made flexible rather than dogmatic. A survey of available data led to the following summary as representing the present status of the pineal gland as an organ of internal secretion.

1. The clinical syndrome was to be associated with disturbances of the functions of the pineal gland. Because of the involution of the pineal at puberty the constitutional manifestations of pineal pathology appeared to be confined to prepubertal years. The essential characteristics (apart from pressure and neighborhood manifestations) were (*a*) early sexual development evidenced in the enlarged genitalia, pubic hair, general body hair, early change in voice; (*b*) precocious mental development, manifested in maturity of thought and speech; (*c*) general overgrowth of body to the extent that a child of six or seven years might have the appearance of a child near puberty. 2. The experimental extirpation of the pineal gland was surgically possible. The gland was not essential for the maintenance of life. The early symptoms following pinealectomy were attributable to the severe brain injury. No changes attended the removal of the gland in adult animals. As to the effects of pinealectomy in young animals, Sarteschi, Foa, and Horrax respectively stated that the removal of the gland led to precocity of development. Exner and Boese, and Dandy reported no changes after pinealectomy. 3. The administration of pineal substance to young animals was reported to hasten growth and sexual maturity. In unicellular organisms (paramècia) pineal extracts increased the rate of reproduction to more than double that of controls. In larval forms (ranidæ) both growth and differentiation were hastened as a result of pineal feeding. 4. The inference was allowable that the pineal gland was an organ of internal secretion whose functions, however, were of minor significance in the general activities of the endocrinous system.

THE PHYSIOLOGICAL AND PATHOLOGICAL IMPORTANCE OF THE PARATHYROID GLAND FROM THE EXPERIMENTAL ASPECT.

Dr. Carl Voegtlin, of Washington, D. C., drew the following conclusions: "1. The parathyroid gland has a definite physiological function which is still imcompletely understood. 2. The presence of a minimum of parathyroid tissue in the body is essential for life and the continuation of normal metabolism. 3. Parathyroid insufficiency seems to be characterized by an increased irritability of the nervous system to the galvanic current, which may be due to the withdrawal of soluble calcium salts from the blood and tissues. Parathyroid insufficiency leads to an alkalosis which is converted into an acidosis as a result of active tetany. Definite metabolic changes take place in animals after complete parathyroidectomy. 4. Pregnancy puts an extra strain on the functions of the parathyroid, as evidenced by the appearance of tetany during this period in partially parathyroidectomized animals. 5. Tetany has been observed during lactation in animals with parathyroid insufficiency. Interruption of lactation was followed by recovery. 6. The offspring of partially parathyroidectomized animals exhibit a marked increase in nerve irritability. 7. An intravenous injection of soluble calcium or strontium salts or hydrochloric acid almost instantly removes the symptoms of tetany. However, tetany may reappear after this treatment and the life of such animals cannot be saved by the continued administration of calcium. The injection of parathyroid extract seems to have a temporary curative effect on tetany animals.

Isotransplantation of parathyroid into animals with parathyroid insufficiency is usually successful.

The spontaneous recovery from tetany in experimental animals is probably due to changes in their metabolism (acidosis) caused by the hyperactivity of the skeletal muscles during tetany.

8. The experimental facts do not support the theory that eclampsia is due to hypoparathyroidism. 9. A condition which might justly be termed hyperparathyroidism is unknown at the present time."

THE RELATION OF THE PARATHYROID SYSTEM TO THE FEMALE GENITAL APPARATUS.

Dr. Eugene H. Pool, of New York City, drew the following conclusions: "1. No direct relationship has been established between the parathyroids and the female sex organs; no morphological changes in the parathyroids have been noted during pregnancy; yet apparently there is a connection between the parathyroids and the sex processes in the female. 2. Tetany, the clinical evidence of insufficient parathyroid function is somewhat prone to occur in menstruating, pregnant and puerperal women, as well as patients suffering from gynecological diseases or who have undergone gynecological operations. 3. The cause of maternal tetany is now referred to parathyroid insufficiency. 4. The function of the parathyroids is apparently closely connected with calcium. 5. There is reason to believe that maternal tetany and lactation tetany are associated with calcium deficiency. 6. Latent tetany, or a subtetanic condition, is much more common in pregnant and puerperal women than is usually assumed. 7. Tetany in new-born infants, the offspring of tetanic mothers, is usually fatal within a short time after birth. 8. In the treatment of maternal tetany, the administration of calcium in large doses is followed by beneficial results in the great majority of cases."

THE THYROID GLAND IN RELATION TO GYNECOLOGY AND OBSTETRICS.

Dr. David Marine, of Cleveland, Ohio, said that in summarizing, it might be stated that there was evidence in man of a thyroid sex gland interrelation recognizable in the female in association with the development of secondary sexual characters, with the menstruation and with pregnancy and also in the male at puberty, but to a very slight degree. The meager evidence available would tend to indicate that the interstitial cells of the ovary and perhaps, also, the adrenal cortex played a major rôle in this relation in the female, as certainly the cells of Leydig did in the male.

The thyroid enlargement was of the nature of a hypertrophy, identical in appearance and so far as they knew, different only in degree from that seen in simple goiter. Both of these reactions could be controlled and prevented either indirectly by giving iodin or directly by giving the iodin containing hormone in physiological cases.

THE POSSIBLE BEARING OF THE THYMUS GLAND UPON THE FEMALE GENITAL TRACT.

Dr. Alwin M. Pappenheimer, of New York City, stated that there were many points of interest in connection with the thymus which he had not attempted to discuss, but it was doubtful whether even the most detailed scrutiny of the enormous literature would lead us to more satisfactory conclusions. The fundamental problems of thymus physiology remained unsolved, and the established facts, which concerned chiefly the normal and abnormal structure of the gland, were not such as lent themselves to clinical application.

THE ENDOCRINE FUNCTION OF THE PANCREAS AND ITS RELATION TO THE SEX LIFE OF WOMEN.

Dr. A. J. Carlson, of Chicago, drew the following conclusions: "1. All evidence supports the view that some substance or hormone secreted by the islands of Langerhans into the blood is necessary for utilization of sugar by the tissues. This function is specific for the pancreas. Other endocrine organs may influence sugar metabolism in a superficial way by altering the sugar mobilization (adrenals, thyroid), or by increasing or decreasing the rate of oxidation in the body in general. The rest of the endocrine glands cannot maintain the power of the tissues to oxidize sugar in the absence of the pancreas, and the hypo- or hyperactivity of other endocrine glands do not produce actual diabetes in the presence of a normal pancreas. 2. While the failure of the tissues to use sugar in the absence of the pancreas is the central and definitely established fact, there are probably other primary defects involved in the development of acidosis, lipemia, increased metabolism, lowered resistance to infection, etc. 3. All the evidence points to the view that true diabetes mellitus in man is primarily the result of pancreatic deficiency (islets). 4.

There is, at present, no organotherapy of diabetes, experimental or clinical. 5. There is, at present, no evidence of any specific relations of the endocrine functions of the pancreas to the gonads, male or female, or to menstruation, pregnancy, and lactation. Absolute diabetes, induced after conception, leads to death of the fetus. Absolute diabetes under careful dietary control permits of normal sex life of women (menstruation, normal pregnancy, normal child, lactation), and pregnancy under such conditions does not aggravate the diabetes. But in the absence of such dietary control the condition of pregnancy aggravates the diabetes in the mother, and uncontrolled diabetes in the mother is extremely injurious to the fetus. There is some evidence that in late stages of pregnancy the fetal pancreas may function for the mother."

THE EXPERIMENTAL AND CLINICAL EVIDENCE AS TO THE INFLUENCE EXERTED BY THE ADRENAL BODIES UPON THE GENITAL SYSTEM.

DR. SWALE VINCENT, of Winnipeg, Manitoba, Canada: Summary: "1. What we call the adrenal body represents the anatomical association of two elements, each of which is derived from a separate and independent system. The adrenal proper, or cortex is a part of the cortical or interrenal system. The medulla is simply an accumulation of chromophil cells of the same nature histologically, chemically and pharmacodynamically, as similar masses of cells in other parts of the body. 2. There is no clear evidence that these two systems are functionally related. 3. The adrenal medulla, as well as the chromophil tissue generally is developed from the sympathetic nervous system. Its duty seems to be to facilitate the functions of this system in certain physiological emergencies. 4. The adrenal cortex (as well as the accessory cortical adrenals) is developed from the germ epithelium, and the evidence is now strongly in favor of the view that it has certain important functions in connection with the development and growth of the sex organs. 5. There is a considerable amount of clinical evidence that tumors of the adrenal cortex are frequently associated with sex abnormalities. 6. The clinical evidence also favors the view that when cortical tumors occur in the female, an accentuation of male secondary sexual characteristics develops, and simultaneously a hypoplastic condition of the internal generative organs supervenes. 7. The additional evidence as to a connection between adrenal cortex and the sexual organs is furnished by the enlargement of the cortex during breeding and pregnancy. 8. Feeding young animals with adrenal gland substance seems to stimulate the growth of the testes. 9. It is possible that a final solution of the problem will only be arrived at when the more general problem of the relationships between the ductless glands shall have been solved."

THE RELATION OF THE OVARY TO THE UTERUS AND THE MAMMARY GLAND FROM THE EXPERIMENTAL ASPECT.

DR. LEO LOEB, of St. Louis, Missouri, drew the following conclusions: "1. The ovary is a complex gland of which the most important constituents are follicles in various stages of growth and atresia, and corpora lutea. In addition we find in some species interstitial gland and some embryonic structures developing parthenogenetically from eggs. 2. Cyclical changes occur both in the ovary and secondarily in the uterus and mammary glands. 3. The primary cyclical changes in the ovary are in sequence; follicle ripening, ovulation, corpus luteum formation. In some species ovulation is accompanied by degeneration of all but the smallest follicles. 4. An elaborate self-regulating mechanism controls ovulation. Normally the corpus luteum inhibits ovulation. During pregnancy the life of the corpus luteum is prolonged. Experimentally ovulation can be influenced at will, accelerated by excising all corpora lutea, or retarded by producing artificial deciduomata. The retarding action of the corpus luteum is chemical, not mechanical. 5. The corpus luteum has a sensitizing action upon the uterus. This action can be analyzed by experimental methods. If the uterus is incised or mechanically stimulated at the time during which the corpus luteum is elaborating this growth substance, maternal placenta (deciduoma) is formed. The mechanical stimuli, therefore, assume in this respect the function which the ovum exerts under normal conditions. The form of growth response of each species is characteristic. The localization of sensitization varies in different species, being limited to the uterus in rabbits and guinea-pigs, but distributed more widely in the human female. No specificity exists in the sensitizing substance given off by the corpus luteum as far as different individuals of the same species are concerned. The life period of experimental deciduomata is short except in pregnancy, during which their persistence is prolonged. 6. Corresponding to and dependent upon the cyclical ovarian changes, uterine cyclical changes occur. The cycle consists of heat, growth, with associated glandular activity, regression and interval. Heat probably is due to maturation of the follicles and dependent upon the absence of corpora lutea; growth activity is the result of corpus luteum secretions; regression marks the cessation of corpus luteum secretion which is followed in the interval by a condition of rest. Pregnancy causing a persistence of the corpus luteum is characterized by an accentuation but not a prolongation of the active phase, and an inhibition of the uterine cyclical changes throughout gestation. 7. While it is possible to produce experimentally during pregnancy a new ovarian cycle, through excision of the corpora lutea, such a new ovarian cycle is not followed by a new uterine cycle. During pregnancy a mechanism is at work preventing the uterine mucosa from responding to the stimuli given off by various ovarian structures. 8. It follows from four and five and six that the corpus luteum subserves at least two functions, inhibiting ovulation and producing a substance which causes growth in the uterus. 9. The ovary shows other noncyclical functions. It has a trophic influence on the genitals and either primarily or secondarily determines the development of the secondary sexual characters. 10. The ovary likewise controls the development of the mammary glands. It exerts a trophic influence on this organ and determines its normal cycle. During heat and subsequent to ovulation proliferated changes occur; these cease while the corpus luteum develops and functionates. 11. The incidence of breast cancer in mice is greatly reduced by castration."

TRANSPLANTATION AND RETENTION OF OVARIAN TISSUE AFTER HYSTERECTOMY.

Dr. William P. Graves, of Boston, drew the following conclusions: "1. The specific surgical menopause symptoms consist chiefly of vasomotor disturbances in the form of hot flushes. 2. Theoretically, vasomotor changes of the artificial menopause are due to a break in the utero-ovarian functional harmony, by which the physiological balance of the glands of internal secretion is upset with consequent dysfunctional activity. 3. After extirpation of the uterus, vasomotor disturbance ensues with approximately equal frequency, whether the ovaries be retained *in situ*, totally ablated, or transplanted. 4. Retention of ovarian tissue after hysterectomy is of little or no physiological value and may be productive of serious harm to the patient."

THE PREPARATION AND STANDARDIZATION OF OVARIAN AND PLACENTAL EXTRACTS.

Dr. William H. Morley, of Detroit, Michigan, drew the following conclusions: "1. A more uniform method of preparing extracts must be instituted. 2. Some method for the standardization of these extracts must be discovered in order to facilitate the comparison of the results of the different laboratory workers and clinicians. 3. Many results obtained in the laboratory or in the clinics are due to the faulty preparation of extracts. 4. The isolation of the active principle of the ovary and the placenta will clear up many, if not all, of these mooted points."

THE PLACENTA REGARDED AS A GLAND OF INTERNAL SECRETION.

Dr. Robert T. Frank, of New York City: Summary: "1. The experimental work of the last decade proves that Halban was correct in ascribing to the placenta an action upon the uterus and breasts. 2. Placental extracts (mainly the lipoid fraction) rapidly induce hyperplasia of the uterus and breast, gland tissue and nipples in castrated or in noncastrated animals. 3. The chemical substance which induces these changes is thermostabile, very resistant to strong alkalies and acids, and completely soluble in 95 per cent. alcohol. 4. The substance appears identical in its physical, chemical and biological properties with a similar substance obtained from the corpus luteum. 5. The substance can exert its influence in the absence of the thyroids, adrenals, pancreas, or in the absence of thyroid and adrenals combined. 6. In view of the apparent identity of corpus luteum and placental substance, the question arises whether the placenta acts merely as a storage reservoir, for corpus luteum secretion during the latter half of pregnancy, or whether the placenta elaborates a hormone of its own."

RELATION OF THE SEX GLANDS TO METABOLISM.

Dr. John R. Murlin and Dr. Harold C. Bailey, of New York City, drew the following conclusions: "Our results uphold the work of Loewy and Richter so far as the reduction in metabolism after castration is concerned. Removal of the ovaries of our dogs was followed by an increase in weight in both and a lowering of the metabolism in from 12 to 17 per cent., and in the other from 6 to 14 per cent. We feel that indirect action has a bearing on this reduction, and we do not believe that the indications point decisively to the loss of a specific stimulus from the ovary affecting the oxidative process of the cells. To throw more light on this complex subject further experiments with animals are necessary."

DISCUSSION.

Dr. J. Whitridge Williams, of Baltimore, said that every one who was dealing with obstetrics knew what pituitrin was and what the extract did. In the discovery of the physiological action of the posterior lobe of this gland we had a most powerful therapeutic agent, one which was doing a great deal of good and, at the same time, doing a great deal of harm. The active principle had not been thoroughly worked out, but there was a good deal to be learned about it. The active principle of the posterior lobe, the pituitary body, and active principle of ergot were closely related, and it was likely in the use of pituitary extract we might go through the same cycle which we went through with the use of ergot. The injection of a cubic centimeter of any of the ordinary pituitary extracts in many cases had a marvelous effect. Within three minutes after injection of this drug the uterus, which previously had been acting in a very sluggish way, took on intense activity, and often labor would be brought to a termination within the next few minutes.

About the thyroid, his practical experience with pregnancy complicated by goiters of various kinds has shown him that the condition could be in great part disregarded.

Dr. George Gellhorn, of St. Louis, Missouri, had observed great improvement in two cases of kraurosis vulvæ. In one there had been permanent relief after feeding the patient ovarian extract; another one was temporarily improved after injecting the extract. Neither suggestion nor deception was permitted to enter. The sole criterion was a change from the dry, glistening, unyielding tissue to a soft, moist, and pinkish mucosa which bore no evidence of scratching. If in two cases of senile osteomalacia the same therapy led to a temporary restoration of locomotion, it was hard to explain it on the ground of suggestion.

Dr. John G. Clark, of Philadelphia, said that with regard to Dr. Goetsch's paper, he could not help but feel that the preservation of normal ovarian tissue was of very vital value in younger women. He made this statement based upon a long series of cases. If there was any one point that was definitely conclusive, it was the retention of ovaries or an ovary, regardless of whether the uterus was present or not. It was of vital importance to a young woman.

He had noticed this in following up his cases, and it had largely determined him along the lines of a more radical policy so far as inflammatory cases were concerned. He had observed in the younger women in the ward that where ovaries suggestively diseased were preserved, these patients did not have a satisfactory or postoperative convalescence. A large proportion of them subsequently suffered pain and distress free from pathology. In fibroid cases in young women, where the ovaries were normal, he saw definitely better results than under the older methods where the ovaries were removed.

DR. FRANCIS CARTER WOOD, of New York City, stated that he had tried the Beatson operation experimentally and the influence of the removal of the ovaries on carcinoma of the breast. This operation produced a temporary effect, which was no doubt due to the removal of the secreting substance of the ovary or due to nutritional and vascular conditions. He took primary tumors in mice and gave large injections of corpus luteum and *x*-rayed a number of the mice and no effect was produced, so that this substance when injected into an animal caused hypertrophy of the breast itself and growth of the epithelium. The cancer tissue lost its power to respond to this peculiar substance.

DR. C. C. GUTHRIE, of Pittsburgh, said that in reference to Dr. Graves' work on the transplantation of ovaries, his interest was aroused years ago when he conducted experiments in laboratory fashion on the transplantation of ovarian tissue. In the later nineties or shortly thereafter, Dr. Robert T. Morris, New York, reported the birth of a child in a woman whose ovaries had been removed and replaced by other ovaries. So far as he knew, this was the first authentic account of the reproductive function after the transplantation of ovaries.

DR. HERMAN J. BOLDT, of New York City, said regarding the case reported by Dr. Morris, he (Dr. Morris) had been waiting for two weeks for him to supply a patient who had had normal ovarian tissue. He did a ventrosuspension on a woman and gave him half of one ovary. In the case of his patient Dr. Morris had removed both ovaries two years previously. The patient had not menstruated during that interval. After the transplantation of ovarian tissue, the patient began to menstruate again, subsequently became pregnant, and bore a child. The child was still living.

URETERAL STRICTURE; REPORT OF 100 CASES.

DR. GUY L. HUNNER, of Baltimore, said that ureteral stricture was far more frequent than formerly suspected. Too much importance was given in the literature to congenital stricture. Most of the cases were due to systemic infection from a distant focus, such as the tonsils, teeth, or sinuses.

The symptoms were local pain at the site of the inflammatory area, renal pain due to back pressure, referred pain to the bladder, rectum, hip, thigh, etc. There was elevation of temperature with and without infection of the urine. Gastrointestinal symptoms and mental symptoms were referred to. The diagnosis must be made from kidney lesions and from lesions of practically every abdominal organ, and also from sacroiliac and other hip-joint lesions. The treatment consisted of dilatation from bladder approach or of retrograde dilatation through the extraperitoneal route.

A CYSTOSCOPIC STUDY OF THE END RESULTS OF VARIOUS FORMS OF CYSTOCELE OPERATIONS.

Dr. Le Roy Broun and Dr. Reginald M. Rawls, of New York City, stated that for the purpose of this preliminary report twelve patients were found to have a practically normal plane of the base of the bladder. Three of these had a mild trigonitis. The character of cystocele operations done upon these patients varied greatly. The larger number consisted of freeing the bladder from the vaginal mucosa and uterus, coapting the prevesical fascia under the bladder and approximating the vaginal mucosa after the excess had been removed. A few of the operations consisted of a simple separation of the vaginal mucosa on each side of the median incision, the removal of the excess, and an approximation of the edges under the bladder. One was after the old Emmet method, and one by anchoring the bladder on a higher plane to the broad ligaments and uterus, after its previous separation from the vaginal mucosa and uterus.

In another series of cases the base of the bladder was found to be thrown into horizontal folds of varying degrees of prominence. There were eight patients in this group. In half of these there was no displacement of the mouths of the ureters; in the other four this displacement was very noticeable. The character of operations done in these cases was as follows: In three, after the separation of the bladder from the vaginal mucosa and the uterus, the prevesical fascia was united under the bladder, the excess of the mucosa was removed, and the edges coapted. In three others, after the separation of the bladder from the mucosa and the uterus, the base of the bladder was anchored by silk sutures higher up on the broad ligament and uterus, or to the shelf made by the united broad ligaments, if the uterus was removed. In one case an oval denudation was made on the anterior wall and the edges coapted. The cystoscopic examination of these eight patients showed the base of the bladder in each instance to be thrown into horizontal folds of varying depth and extent. In some the mouths of the ureters were found displaced; in others, in addition to the displacement one or both could not be located. Trigonitis of a mild degree of the granular or membranous type was the usual accompaniment.

The uniform method of putting 300 c.c. of water in the bladder was followed in the entire cystoscopic study. When abnormalities were found, as in these and other cases, the bladder was distended to its full capacity to determine whether or not the folds would disappear. In no instance was this accomplished. The convolutions and sulci remained as first seen under the 300 c.c. distention, showing that they were of a permanent character.

The kind of operation done did not seem to bear in a marked degree upon the character and extent of the permanent folds found to be present.

This review of the study of the end results on these patients, from the viewpoint of the anatomical condition in which the base of the bladder was left, was not of a flattering character. That the abnormal conditions found were of a permanent character could not be questioned, since they did not disappear under full distention.

A VAGINAL SUBTOTAL HYSTERECTOMY TECHNIC, EQUALLY APPLICABLE TO CASES WITH OR WITHOUT PROCIDENTIA UTERI OR CYSTOCELE.

Dr. Dougal Bissell, of New York City, described a technic for subtotal vaginal hysterectomy. Subtotal vaginal hysterectomy was preferable to total hysterectomy when the vaginal route for hysterectomy was the route of choice. Subtotal vaginal hysterectomy less difficult to perform than total vaginal hysterectomy. There was was less liability to secondary hemorrhage, and should secondary hemorrhage occur it was under easy control. As the uterine arteries were not tied the uterine and ovarian circulation were not interfered with. There was minimum liability to sepsis as the posterior culdesac was not opened. Peritoneal drainage was not resorted to. The union was primary.

When subtotal vaginal hysterectomy was performed, procidentia of the uterus and cystocele could be corrected at the same time. For procidentia the uterosacral ligaments were in addition shortened. For cystocele the newly formed uterine body was interposed as in the Watkins operation, or the body could be returned to the peritoneal cavity and the posterior surface and part of the base of the bladder sutured to its anterior face. Reconstruction of the fascial shelf between the bladder and the anterior vaginal wall then became necessary.

TREATMENT OF CYSTOCELE AND UTERINE PROLAPSE DURING THE CHILD-BEARING PERIOD.

Dr. Thomas J. Watkins, of Chicago, believed the transposition operation was the ideal remedy for cystocele and uterine prolapse after the menopause. His paper was limited to the treatment of cases that could be relieved by operations which did not endanger pregnancy or labor.

The transverse incision in front of the cervix should extend freely across the anterior vaginal wall to permit the cervix to tilt upward and backward easily as the operation progressed. This lengthened the anterior vaginal wall and allowed the body of the uterus to drop forward without undue flexure. The anterior vaginal wall was frequently congenitally or otherwise shortened in these cases. Separation of the anterior vaginal wall from the bladder by blunt dissection with the Mayo scissors saved time and lessened bleeding and traumatism if care was taken to find the plane of fascia between the vagina and bladder. The width of the separation varied.

Separation of the bladder from the cervix was also most satisfactorily done with scissors, if caution was taken to find the dividing plane of fascia. The herniated portion of the bladder should now be completely freed from the sac.

The peritoneum was incised if the cystocele was large, if intraperitoneal exploration was desired, if the uterus was retrodisplaced, or if vaginal fixation of the round ligaments was contemplated. At this time amputation of the cervix, if indicated, was done. The author believed in amputation in occasional cases of excessive elongation of the cervix *only* because it endangered labor and stenosis.

Plastic operation on the broad ligaments was a valuable adjunct to the operation, if the uterus was much prolapsed, much increased in size, or if the anterior vaginal wall was much shortened. Plastic operation upon the broad ligaments lengthened the anterior vaginal wall, shortened the broad ligaments, and therefore elevated the uterus in the pelvis, increased the anteversion of the uterus, thus lessening intraabdominal pressure, decreasing the amount of tension upon the united tissues, lessening the tendency of the line of union to stretch, and materially insuring a permanent result.

As to vaginal fixation of the round ligaments, the technic was much the same as was formerly employed in the treatment of retropositions of the uterus. It was especially valuable when the prolapse was complicated by backward displacement of the uterus. It was also of great value in cases of extensive prolapse of the uterus.

Advancement of the anterior vaginal wall upon the uterus consisted in changing the plane of attachment of the vaginal wall to the uterus to a plane higher on the uterus than formerly occupied, as devised by Goffe. The more the vaginal wall was advanced upon the uterus, the more certain must be the cure of the bladder and uterine displacements. The possible danger consisted in complicating pregnancy and labor. As regards pregnancy and labor, it was not safe to attach the vagina much higher than the anterior reflection of the peritoneum. Redundant tissue should be excised to an extent consistent with minimum tension upon sutures.

The author believed it advisable to use interrupted, buried, fine linen or silk for suture of the broad ligaments, for suture of loops of the round ligaments, and in exceptional cases to use two or three such sutures in the submucous connective tissue.

Hemostasis should receive very careful attention before the wound was closed, as it determined very largely the character of the convalescence.

Before complete closure of the wound was the most convenient time to make any necessary repairs of the cervix. These might be unilateral or bilateral. Complete amputation of the anterior lip, with or without wedge-shaped excision of the posterior lip, might be required. Perineorrhaphy was usually indicated and was necessary to a satisfactory result.

In summarizing the author stated that wide incision anterior to the cervix, free separation of the herniated part of the bladder, closure of the hernial opening by circular sutures, restoration and fixation of the urethrocele, and perineorrhaphy were essential features in the operation.

Amputation of the cervix, trachelorrhaphy, plastic surgery on the broad ligaments, and vaginal fixation of the round ligaments were adjuncts which could be utilized according to the needs of individual cases.

DISCUSSION ON THE PAPERS OF DRS. WATKINS, BROWN AND BISSELL.

Dr. Herman J. Boldt, of New York City, said he had given up operation for displacement of the bladder entirely, and now limited himself to an extensive colporrhaphy, that is, as extensive an operation as circumstances would warrant. He called attention to a feature which Dr. Watkins had directed attention to, namely, be sure to get away that part of the vaginal mucosa directly beneath the meatus urinarius because that always came down, and it was essential to get that away; then the necessary plastic operation on the floor of the pelvis, and winding up with an abdominal operation, a Gilliam suspension of the uterus, bringing the uterus up as high as one could possibly bring it. He had found that in doing the operation in that way he could avoid, as a rule, vesical symptoms subsequently and bring about a permanent cure of the patient.

In reference to Dr. Bissell's paper, the large mortality from the technic of subtotal hysterectomy did not strike him favorably, and he would therefore hesitate to follow that method.

Dr. Henry P. Newman, San Diego, California, stated that only a few weeks ago he presented to the California State Medical Society, a paper in which he followed the method of Dr. Watkins, and was very happy to say that he could confirm what Dr. Watkins had said and with equally favorable results. The Watkins operation was preferable in certain cases. Where one could do operative work without entering the peritoneal cavity it was advisable to do so, and in certain cases it simplified the operative procedure. Amputation of the cervix uteri was not necessary in many instances except in pathologic deviations. Prolapse of the bladder and cystocele occurred in the virgin or unmarried woman, and were not the result of lacerations, as had been demonstrated and as he had seen in a number of cases.

Dr. Hiram N. Vineberg, of New York City, asked Dr. Watkins whether in suturing the broad ligaments in front of the cervix he grasped the uterine vessels in the broad ligament when he cut.

Dr. Watkins replied that he usually kept inside.

Dr. Vineberg said, referring to the round ligament, he did not see there was any advantage in Dr. Watkins' description from that which was described fifteen years ago. He would be afraid to use buried silk. It had been used and given up. At a short distance from the bladder buried silk had worked its way into the bladder. He was quite sure Dr. Watkins used a circular suture which he described some time ago as the subpubic fascial suture, and that was sufficient to cure these cases without doing a complicated operation besides. In that class of cases the speaker had had excellent results. In trying to cure retroversion by suturing the round ligaments to the vaginal wall the results were not so good; at least, one out of four would recur in time.

Dr. John W. Keefe, of Providence, Rhode Island, said that it seemed to him we already had a sufficient number of operations, and that it was unnecessary to devise new ones. A surgeon to be a good plastic operator should keep a picture in his mind as to what the normal anatomy was, and then he should try and place the uterus in as nearly normal position as possible. When he sat down to operate on a case of prolapse he did not think he should conclude beforehand that he would do this or that operation; he thought he should have mechanical ingenuity and should, as he went along, do what was best for that particular case, because no two cases were exactly alike. There were simple ways of doing operations on the cervix and on the perineum. He thought the operation of Dr. Watkins was a good one for a cystocele.

He mentioned three cases out of a number he had done for prolapse of the uterus. These were aggravated cases following instrumental delivery during first childbirth with the uterus outside. He amputated the cervix. Dr. Watkins said this was a bar against subsequent pregnancy, and that it produced stenosis, but the speaker thought that one could amputate the cervix and the patient would become pregnant and she would not have stenosis. He amputated the cervix, did an operation for the cystocele, did a perineal operation, and an Alexander operation on the round ligament.

Dr. George Gray Ward, Jr., of New York City, spoke in reference to the question of prolapse of the uterus, saying that the first thing to be borne in mind was to appreciate what was the normal anatomical condition present. What was it that supported the uterus? The base of the broad ligaments and the uterosacral ligaments were those which offered the most resistance in removing the uterus by hysterectomy. When one cut through these tissues the uterus was free and loose. The so-called cardinal ligaments must be the uterosacrals and were the chief supports of the uterus. The round ligaments were guy-ropes, largely structures limiting the extension backward of the uterus and drawing it forward as the bladder emptied itself. He did not believe these muscles were intended to carry the weight to support the uterus. In the ordinary case of prolapse, what was the trouble? There was an elongation of these supports, the cardinal and uterosacral ligaments, and in correcting this condition, if one tried to restore the uterus to its previous condition he would be doing what was more nearly right. In extreme cases something else should be done, as, for instance, Dr. Watkins' procedure; but the operation he preferred to do in these cases of prolapse was one which had been well brought out and shown by one of the members, Dr. Dudley, especially in his text-book, of freeing the base of the broad ligaments and bringing them in front of the cervix, plus shortening the uterosacrals per vaginam, which was not difficult to do, if the vagina was fairly large, with a fair degree of prolapse. This seemed to him to be the most ideal type of operation to do in these cases.

Dr. Watkins, in closing the discussion on his part, agreed practically with all of what Dr. Keefe had said. In the operation described there was a broad incision of the cervix, with thorough separation of the anterior part of the bladder. A circular suture was used for closing the hernial opening, and fixation by the use of silk was an essential of the operation. Plastic operations on the broad ligaments were not fixations, they were adjuncts, which could be adapted to individual cases.

Dr. Bissell, in closing the discussion on his part, stated that he had presented his paper as a study; that he had gained a great deal of information from the discussion and would follow the study in a little different line, and the first advantage was that of protecting Douglas' culdesac, and not entering it when one was doing vaginal hysterectomy. It was absolutely necessary to keep the contents of the vagina from not entering the peritoneal cavity posteriorly. A second advantage in this method of operating was that one left the circulation of the ovaries intact; he did not interfere with the uterine circulation, and the uteroovarian circulation was not in any way interfered with, so that the ovary had a normal blood supply. A third point was that there was practically no chance of hemorrhage.

Dr. Rawls, in closing the discussion, said that while one might agree with Dr. Keefe that there were enough operations for cystocele, their joint paper brought out one point, namely, that the trigone of the bladder was not restored to a normal condition, and while they were not able to state in the paper that these transverse folds had caused any immediate trouble, they were inclined to think that they would get immediate trouble because they had found displaced ureters; they had found folds in the trigone which should be smooth folds extending up to the urethra, and they had found that while there was a mild trigonitis, very few with symptoms before operation were easily relieved, and not increased except in one instance.

CLINICAL STUDY OF BLOOD PRESSURE, PULSE PRESSURE, HEMOGLOBIN IN POSTOPERATIVE SHOCK, POSTOPERATIVE HEMORRHAGE, AND POSTOPERATIVE CARDIAC DILATATION.

Dr. John O. Polak, of Brooklyn, New York, stated that the deductions which one might draw from his studies were: "1. There is a constant rise of from five to fifteen points in the hemoglobin readings following anesthesia with ether, when such anesthesia occupies more than thirty minutes. Consequently, allowance must be made for this rise in using hemoglobin estimations as a diagnostic sign in internal bleeding. 2. The erythrocyte count is also increased, but its variation from the preoperative is so slight that it does not warrant any conclusions. 3. In the majority of cases there is a moderate fall in both the systolic and diastolic blood pressure following ether anesthesia. The blood pressure returns to normal, that is, to preoperative reading, in from twelve to forty-eight hours. The inhalation of oxygen after the withdrawal of the ether vapor diminishes this fall in blood pressure, but is only transient in its effect. 4. In cases of shock, especially where there has been much blood lost during the operation the fall in blood pressure is greater than after long operation without blood loss, dropping from ten to fifteen minutes. 5. The pulse pressure is a better index of hemorrhage or cardiac failure than the systolic pressure. 6. There is a constant rise in the leukocyte count in hemorrhages, while the leukocytes fall in shock."

DISCUSSION.

Dr. R. R. Huggins, of Pittsburgh, stated that his associate and himself for two or three years had been interested in the study of blood pressure previous to the time of operation and during operation. As he understood Dr. Polak, his findings dealt largely with postoperative results. The speaker believed that the horsepower of the individual, that is, the strength of the heart muscle, was told perhaps better by pulse pressure than by any other method yet discovered. He quoted Dr. Moots, of Toledo, who reported the findings in a series of 10,000 anesthesias, and his conclusions were that during ether anesthesia, whether in the first twenty or first forty minutes, when there was an approach of the diastolic and systolic pressure, it was a symptom of danger. The speaker believed that one could, by careful observations of blood pressure in patients before operation select or pick the case. When a patient had a pulse pressure of about 25 or 30, if that patient was chased around the ward two or three times, and there was a perceptible fall in pulse pressure, she was a bad risk. He believed that the effect of exercise on pulse pressure was an important index to the horsepower of the patient's heart.

Dr. Polak, in closing the discussion, said he was in absolute accord with Dr. Huggins that the preoperative pulse pressure was the index. Since reading a paper sometime ago by Dr. Huggins, the speaker had utilized the test of muscular exercise, both passive and active, on these cases. For instance, in long-continued septic cases, where women had gone through months of infection before it had quieted down, the question arose what the heart would do, which was only an index or part of the body economy, and the result of the musculature being just the same, what would it do. A woman would be found, for instance, lying in bed, with a pulse pressure of 35 or 40, yet if a nurse made passive exercise with that patient or have her on a flat table and use active abdominal exercise with her legs and thighs, a definite change in the pulse pressure would take place, and this could be looked upon as an index of what her operative strength was. The cases reported were studied for a period of several days, some of them for several weeks, as to their pulse pressure before operation. Most of the speaker's studies had been during and immediately following the anesthetic, and during the first forty-eight hours postoperative.

REVIEWS.

CASE HISTORIES IN OBSTETRICS. By ROBERT L. DENORMANDIE, A. B., M. D., F. A. C. S., Assistant in Obstetrics, Harvard Medical School; Assistant Physician, Boston Lying-In Hospital; Surgeon to the Gynecological Department of the Boston Dispensary. Second Edition. W. M. Leonard, Boston, 1917.

In the second edition of this valuable book the author has taken occasion to incorporate a number of changes in the text, especially in the sections relating to accidental hemorrhage, pyelitis, and scopolamine-morphine anesthesia. The subject of nitrous oxide and oxygen in obstetrics is also referred to; otherwise the form and subject matter is the same as in the earlier edition. The author's estimation of the value of the so-called twilight sleep method is that which has now gained credence throughout the profession and he concludes wisely that it has a small place in obstetrics except for certain isolated cases of high-strung, nervous women. He is convinced that other means of analgesia are more satisfactory for the general run of cases.

The method of teaching medical specialties by means of case histories has now been accepted as a valuable and fixed addition to our teaching armamentarium and the present work is an excellent example of what may be accomplished by this method.

REST, SUGGESTION AND OTHER THERAPEUTIC MEASURES IN NERVOUS AND MENTAL DISEASES. By FRANCIS X. DERCUM, A. M., M. D., PH. D., Professor of Nervous and Mental Diseases in the Jefferson Medical College, Philadelphia; Ex-President of the American Neurological Association, of the Philadelphia Neurological Society and of the Philadelphia Psychiatric Society; Foreign Corresponding Member of the Neurological Society of Paris, Etc., Etc. Second Edition. Price $3.50 net. P. Blakiston's Son & Co., Philadelphia, 1917.

A really excellent work is that of Professor Dercum noted herewith, of which the second edition has recently appeared. It should prove of particular value to the gynecologist and obstetrician, who will find a great many important topics treated in its pages that bear directly on these specialties. Dr. Dercum's book appeared originally as one of the constituent volumes of the "System of Physiologic Therapeutics" edited by Dr. S. Solis-Cohen but the present edition has been largely rewritten and revised to bring it up to date with the advances of our knowledge on the subject. Treatment has been made a very important feature of the work and emphasis laid on the simpler methods such as rest, feeding, and psychotherapy. A great deal of space is given to the subject of mental suggestion and a critical review presented of the various legitimate methods and those to which a less complimentary term may be applied.

The book is well written and therefore easily read. It is also a pleasure to note the fact that it is printed on a light, unglazed paper which adds greatly to the pleasure of handling the same.

PHYSICAL EXERCISES FOR INVALIDS AND CONVALESCENTS. By EDWARD H. OCHSNER, B. S., M. D., F. A. C. S. Illustrated. C. V. Mosby Company, St. Louis, 1917.

Dr. Ochsner's little book will serve as a convenient and compact manual of physical exercises for convalescents, which may be safely given to patients of intelligence as a basis for this important adjunct to surgical treatment. By way of introduction the author inserts a chapter on general considerations in which the objects of the various exercises are described. A series of forty different exercises is illustrated and the various steps briefly detailed. The book should meet with a favorable reception and may be commended to the profession. The use of exercise in patients recovering from gynecological operations and after childbirth is a matter that is very often neglected because of the general belief that such exercises cannot be done without an instructor or apparatus.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Bilateral Oöphorectomy in a Gravida; Labor at Term.—Stropeni (*Annali di ostetricia e gynecologia*, 1916, xxxviii, 493) reports a successful case of this intervention. The diagnosis had been dermoid cyst of the left ovary; but after laparotomy the right one was seen to be equally compromised. The microscopic diagnosis was luteinic sarcoma. At the time of operation the patient was four months pregnant. Gestation went on naturally to term and labor and puerperium were normal. The child weighed at birth 5 kilos and was fully developed and unusually vigorous. The mammary function was in no wise compromised by loss of the ovaries. The mother had as much milk as in her former lactation periods and nursed the infant for about eight months. Nevertheless after the intervention she suffered acutely from the loss of her ovaries (although as a matter of fact the proper tissue of the organs had practically disappeared). The symptoms were at first wholly subjective—prostration, headache, nausea, irascibility, hyperesthesia, etc. At a later period patient exhibited agitation, tremor, profuse sweating and other objective phenomena. Placed on ovarian extract she improved notably and the remedy was continued up to the time of labor.

Salpingo-ovaritis as a Complication of Pregnancy.—Brindeau (*Archives mensuelles d'obstetrique et de gynecologie*, 1917, vi, p. 1) has collected notes of ninety-three cases of this association, of which twelve are personal. In the great majority the lesions were present at the time of conception; in fact it is usually difficult to prove the occurrence of the postconceptional type. As a rule old infectious annexitis prevents fecundation, and when the latter has resulted complications may not develop; in fact at times gestation is beneficial. In a certain margin of cases gestation sets up complications, some of which are purely mechanical (pain, adhesions, uterine deviations, torsion of the tube) and others septic; the latter are much more important from the clinical point of view and tend to occur either at the debut of gestation (31 per cent.) or at its close (end of labor and puerperal period). They comprise exacerbations of annexitis, periuterine cellulitis and generalized peritonitis, the latter being of the perforative type. Generally speaking the "obstetrical act," whether an abortion or accouchement proper, is often the determining factor. Early surgical intervention is indicated not only in the interest of the mother's life but in that of conserving the product of conception. If the latter has already been expelled the condition is simply a postpartum complication. In the presence of a localized infection armed expectancy is indicated for the time being. If generalized peritonitis is already present immediate laparotomy will now and then snatch a patient from certain death. Of the 93 observations there was surgical intervention in 44. Of 49 patients not submitted to operation 19 recovered (mortality 62 per cent.). Of 44 operative cases 38 recovered (mortality 14 per cent.). Of the 6 deaths despite intervention 2 followed colpotomy; 2 (out of 4) hysterectomy; 1 salpingectomy; and 1 (out of 3) laparotomy. There was no mortality after 11 bilateral castrations and 5 ablations of tube and appendix and but 1 fatality in 10 salpingectomies. The author, however, warns against the optimism which such favorable figures appear to justify. Five at least of the 44 operations appear to have been performed for nonseptic conditions.

Grippe and Gestation.—Chomé (*Archives mensuelles d'obstetrique et de gynecologie*, 1917, vi, p. 66) reports eighteen cases of grippe in gravidæ and puerpera (in the former the disease extended into the puerperium) and concludes that while in the mild, sporadic form the two conditions are not modified, in the epidemic or endemic form, with incidence in a maternity hospital or ward, grippe is a very serious thing, its seriousness depending on the secondary complications, especially the pulmonary; in fact in the gravida there is plainly a special tendency to involvement of the lungs as shown by statistics (as high as 90 per cent. in some maternities). Labor appears to exert an unfortunate influence on the course of grippe and in many cases the latter seems to change its character so that septicemia replaces it. A woman delivered in the presence of fully developed grippe is very apt to develop puerperal peritonitis.

GYNECOLOGY AND ABDOMINAL SURGERY.

Radiotherapy in Gynecology.—F. E. Keene's (*Penn. Med. Jour.*, 1917, xx, 469) opinion is based upon an analysis of sixty-nine malignant growths of the cervix, vagina and urethra, and forty-seven cases of benign hemorrhage of myomatous or myopathic origin. He believes that in even fairly advanced cases of carcinoma of the fundus, operation is the treatment of choice and radium should not be used. In all cases of early cervical cancer radical operation is to be advised. In the more advanced stages, which are questionably operable, the application of radium is the procedure of choice. In such cases, if radium has produced an apparent cure, operation at a later date with the idea of further eradication of the disease is inadvisable. The application of radium in the vaginal cuff immediately after radical operation may be followed by disastrous sequelæ. For the control of hemorrhage and foul discharge in cases beyond the operable stage, radium is by far the best means at our disposal. Even these cases may exhibit what is apparently a complete cure. In a certain percentage of cases radium will have no effect on the growth or may actually stimulate it to more rapid extension. The majority, however, show a rapid destruction of the cancer area with local healing of the ulceration in over 40 per cent. The deeper extensions or metastases are little if at all affected; hemorrhage and discharge will be controlled but the advance of the disease will be unchecked.

Radium is the treatment of choice in all cases of small, uncomplicated myomata, whose only symptom is hemorrhage. In these as well as in cases of myopathic hemorrhage, 100 per cent. cure can be expected. In young women, radium should be used with the greatest caution, since its application may be followed by a premature menopause. Irregular bleeding due to pelvic inflammatory disease, tumors of large size or tumors of any size complicated by disease of the adnexa or surrounding structures, as well as myomata in young women, are to be treated by appropriate operation and not by the application of radium. In no case of uterine bleeding should radium be used without a preliminary curettage and microscopic examination of the curettings by a competent pathologist. In properly selected cases the immediate convalescence is smooth and restoration to health is complete. Pelvic pain rarely occurs and as a rule is of but a few days' duration. In the exceptional case profuse leukorrhea follows the application of radium, but this is not permanent. Not infrequently radium has cured or diminished discharge which was present before its application.

Carcinomatous Ovarian Teratoma with Premature Puberty and Precocious Development.—A case of carcinomatous ovarian teratoma is reported by R. H. Harris (*Surg., Gyn. & Obst.*, 1917, xxiv, 604). These growths are rare. No other case reported as ovarian teratoma has been associated with precocious sexual and somatic development. The patient, five years and ten months of age, was younger than any of the published cases of ovarian teratoma excepting three. The growth of the tumor was associated with the beginning of puberty at five years of age and with rapid bodily development. It was a complex cysto-solid teratoma with definite adenocarcinomatous areas. There has been no menstruation since the removal of the tumor and no further precocious growth. There was no discoverable recurrence when the patient was examined thirty months after the removal of the tumor, a much longer time than the average freedom from recurrence.

· **On the Blood Loss from Menstruation.**—Lahille (*Annale de gynécologie et d'obstetrique*, 1917, xii, 535) finds that various reference works place the mean total loss of blood during a normal menstrual period at about 200 gm., *i.e.*, this figure comes nearer a consensus of opinion than any other while it also represents a fair average between higher and lower figures. He has made a study of seven women in this regard in which he computes the amount of blood through the iron ash of the hemoglobin. This method was apparently devised by Gautier in 1897 who found that 100 gm. hemoglobin contains 0.39 gm. iron. The amount of hemoglobin in the blood varies with the individual so that this method is only an approximation. The author used 13.5 gm. as representing the amount of hemoglobin in 100 gm. female blood. If his method is trustworthy and the few women normal examples the figure 200 gm. must be absurdly high, for 80 gm. represents the loss of blood by women who flow most freely—just short of menorrhagia—while from 50 to 65 gm. represents the loss of the average woman. A fourth of the women should lose not over 20 gm. at a normal menstruation. Various conclusions are drawn as to the amount of blood lost during each of the four or five days of menstruation. Generally speaking the days of greatest loss are the second and third.

Sudden Postoperative Death and Tuberculosis of the Suprarenal Bodies.—Brindeau (*Archives mensuelles d'obstetrique et de gynécologie*, 1917, vi, 159) reports the case of a woman who while in apparent health was operated on for perineal rupture. Pigmentation on the face suggested a so-called mask of pregnancy which had not cleared up but according to the patient this she had "always" had. She bore the operation well and on the first postoperative day the vaginal gauze was removed. She was given opiates by the mouth and complained much of thirst. On the second postoperative day she was found dead in bed. Autopsy showed nothing abnormal in the operative field. There was slightly advanced tuberculosis of the lungs and tuberculosis of both adrenals. The efficient cause of death was held to be sudden insufficiency of the adrenals produced by the action of the chloroform used for operative narcosis upon the already diseased organs. This opinion was reinforced by macroscopic and histological alterations of the liver and kidneys, which were of the type seen in chloroform deaths.

DEPARTMENT OF PEDIATRICS.

AMERICAN MEDICAL ASSOCIATION.

Sixty-eight Annual Session, Held in New York City, June 4–8, 1917.

(*Continued from September Number.*)

THE EFFECT OF BODY POSTURE ON THE POSITION AND EMPTYING TIME OF THE STOMACH.

Nineteen observations have been made on five cases to ascertain the effect of body posture on the position of the meal in the stomach. In twelve cases thirty-three observations were made in order to compare the influence of posture in the prone, right lateral, left lateral, and erect positions. We have concluded from these observations that the position of the stomach and especially the position of the solid contents of the stomach is definitely influenced by the body posture. In one of our cases the age at which the adult type of stomach was reached was two years. Motility of the stomach is most rapid in the right lateral position. The supine position produces a comparatively slow motility. Active peristalsis in the stomach was noted in the stomach as early as the fourth month.

DISCUSSION.

Dr. Louis C. Ager, Brooklyn.—Did I understand you to say that the babies were kept in one position during every period of digestion in this series of pictures?

Dr. Rood Taylor, Minneapolis.—Dr. DeBuys has given us valuable information on this subject. It is one in which I have been interested for the past two years. We have made a number of observations with a catheter in the stomach. A number of observations have been made with the *x*-ray and the usual bismuth meal. We have been watching the level of the fluid in the stomach. We have also constructed an instrument, a long flexible rubber tube with a weighted end with which we can get the entire contents of the infant's stomach.

Dr. L. R. DeBuys, New Orleans.—In answer to Dr. Ager's question, I said in the first part of my paper that the babies were given the meal and immediately fluoroscoped and a tracing was made. The babies were kept in the one position during the entire period of observation.

I would like to have heard more of Dr. Taylor's experience with reference to the change in the position of the stomach when he endeavors to get the entire contents of the stomach.

Dr. Louis Fischer, New York, read a paper entitled

RECENT LITERATURE PERTAINING TO VITAMINES: THEIR APPLICATION IN INFANT FEEDING.

From the conclusions of Funk and his coworkers deficiency disease results from the deficiency or absence of a crystalline substance or substances which can be chemically isolated, and to which the name "vitamine" has been given. This vitamine is an antiscorbutic element and when absent is an important factor in the development of Barlow's disease, rickets, and beriberi.

According to these investigators all food contains vitamine. Just as we find some foods high or low in fats or proteins, we find foods high, and others low in vitamine.

Funk states that a definite relationship exists between the onset of certain deficiency diseases and the amount of carbohydrates consumed, and that it is certain there is a definite relationship between the vitamine content of the food and the amount of carbohydrates which have to undergo metabolism. Accordingly the fact must be emphasized that a certain amount of vitamine can take care only of a limited amount of carbohydrate.

Another interesting point brought out by Funk is that animals fed on white rice or rice from which the shell containing the vitamine has been removed, showed marked changes in the chemical composition of the brain. Remembering that the most characteristic feature of the deficiency diseases is a group of symptoms arising from the central nervous system his findings must be regarded as very important. Experiments were made with autolyzed yeast, and it was found that when 3 per cent. of yeast is added to food of white rats their growth was stimulated. When symptoms of a deficiency disease were noted in infants or children, autolyzed yeast in doses of 10 to 60 drops was added to the food.

The clinical aspect of vitamine therapy has been studied by M. Stark and Edelman at the Post-Graduate Hospital, and their interesting report in American Medicine, November, 1916 deserves careful study.

The action of the vitamine is to stimulate internal secretions. By setting free these secretions they act as hormones. These hormones again stimulate the enzymes. To guard against deficiency diseases vitaminic foods such as spinach, and other vegetable juices should be given during the early months of infancy. To give the live factor or vitamine necessary to the proper assimilation of food we must give a mixed diet consisting of fresh vegetables such as potatoes, spinach, dandelion, carrots, peas, and beans, in addition to fruit juices such as orange, lime and pineapple juice, fresh milk, fresh meat, and hard boiled yolk of egg. The outer coats of wheat, oats, and especially barley are rich in vitamine. The excellent results obtained by Kassowitz with phosphor cod-liver oil therapy in rachitis, in the light of our present-day knowledge, is due to the vitamine content of the cod-liver oil.

When the vitamine is absent from food there is a lack of coördination of the food elements, and the resulting metabolism is abnormal. There is a deficiency of the food compounds, and this deficiency is shown by a series of symptoms such as restlessness, irritability, and greenish stools containing either mucus or curds. There is a stationary weight, sometimes loss of weight. If food rich in vitamine is given these symptoms gradually subside, there is a stimulation of growth and weight, and the child regains or reaches its normal condition. If neglected one of the deficiency diseases such as rickets or scurvy will follow. It is our duty therefore to prevent the development of the deficiency diseases which in time means structural weakness. Such children are more susceptible to the acute infectious diseases and offer less resistance to disease in general.

DISCUSSION.

Dr. George Dow Scott, New York.—Interlocked with the vitamines are two other factors, the calories and the food composition. I, for many years before Funk came out with his investigation, had been trying to have the profession use cooked fruits and vegetables and I called attention to them as vital factors in the diet. Then Funk came out with the term vitamines and these are allied with the fruits which form an important addition to the milk modifications. There are large amounts of vitamines in fruits, vegetables and salads. It is important to know in what proportions vitamines enter into certain foods, so that we should have not only their caloric value but their vitamine value as well. It is certain that the addition of a proper amount of vitamines to the food causes a more rapid growth. In a former paper relative to scurvy and the cure of scurvy by the administration of vitamines I emphasized the fact that sterilization and pasteurization of milk absolutely mutilated it and pasteurization even in a moderate degree affected the vitamines in the milk.

Dr. Levi, Philadelphia.—In one child having a scorbutic condition and ecchymoses we tried giving brewer's yeast. We found that if the yeast was mixed with chocolate the child would take it more readily. With this treatment the ecchymosis cleared up and the scorbutic condition was cured.

Dr. Thomas S. Southworth, New York.—This question of vitamines is an important one and especially important is it that we should give young children rather early some more living and vital principle than is contained in boiled or pasteurized milk. But if I were to sit on a jury in reference to the first case reported by Dr. Fischer, I fear I should return a verdict of "not proven," because if I understood correctly that baby had breast milk and for only a very short period was it without vitamines. Certainly the breast milk would have supplied sufficient vitamines, I would ascribe the increase in growth and weight in that case to the addition of more food rather than to the vitamines.

Dr. I. H. Goldberger, New York.—What was the nature of the Zweiback, whole wheat or white bread?

Dr. Louis Fischer, New York.—The vitamine deficiency in the food of infants may be supplied simply by adding spinach boiled, chopped, and pressed through a sieve. The vegetable juices are not sufficient we must give the vegetables themselves; begin with a little and work the amount up gradually. As to the question whether we used whole wheat or white wheat bread, we used Kellogs and also had it made from whole wheat bread. Dr. Southworth does not agree that in the first case the improvement was due to the vitamine addition to the food, but I am sure that if he had seen these babies he would have been just as enthusiastic as we are. We have also used autolyzed yeast in addition to spinach. I have had a series of twenty cases with about seven failures, but we have had so many successes that we have every confidence in advising these additions to the diet of the infant that will supply the necessary amount of vitamines.

Dr. William P. Lucas, San Francisco, read a paper entitled

A STUDY OF THE DIARRHEAL CONDITIONS FOUND IN CALIFORNIA, ESPECIALLY SAN FRANCISCO, AND A COMPARISON OF SUCH CONDITIONS IN CALIFORNIA AND ON THE ATLANTIC SEACOAST.

Relative humidity is a term used in attempts to describe relative dampness of a locality. The term is misleading and cannot give a proper basis for comparison unless the temperature is also given, inasmuch as relative humidity throughout the year is high, but during the summer months, owing to the low temperature the absolute weight of water vapor per cent. of volume and the water tension are much less than at the coast stations of the Atlantic. The tables presented show the mean vapor pressures and the temperature at San Francisco, New York, Chicago, New Orleans. They show that notwithstanding the high relative humidity in summer, the vapor tension and absolute humidity are low in San Francisco.

In the Registration Area deaths of infants under one year of age have a percentage of 22.6 as compared with 12.5 per cent. for San Francisco during the same year. Tables giving the deaths from diarrheal disease and enteritis in children under two years of age for the geographical divisions in the State of California from 1906 to 1916 show a small number of cases in Northern California. They show that only 5.4 per cent. of the total number of cases registered had diarrhea, either infectious or noninfectious, while in the hospital during the same period, of the cases admitted only 5.8 per cent. were diagnosed as diarrhea either infectious or non-infectious. Of the 5.8 per cent. in which the diagnosis was diarrhea, 2.8 were infectious and 3 per cent. were noninfectious. There were more cases under than over two years of age. The severity of the cases could be seen from the mortality rate of 20.8 per cent. for cases of infectious diarrhea. On the whole the total mortality for infectious diarrhea treated both in the hospital and in the out-patient department was 11.3. The diagnosis was based on the clinical history, the presence of temperature, and diarrhea with pus or blood or both. The duration of the symptoms was considerably shorter than that of similar cases treated in the East. Thirty-three per cent. remained under treatment before being discharged as well for one week; 25 per cent. remained two weeks; 8.3 per cent. remained three weeks and a similar percentage of the cases remained four and five weeks; 16.6 per cent. remained for six weeks. The same chronicity does not seem to exist in these cases as is now prevalent in the East. Of the infectious cases only 38.4 per cent. came from institutions and; 61.6 per cent. from homes.

We have found no bacillary dysentery due to the Shiga organism but we have found those belonging to the paradysentery group, the Hiss-Y-Russel type and the Flexner and Morgan type. That groups one, two and three, of the paradysentery type are frequently found in the region of San Francisco is to be doubted and is not borne out by our figures of the incidence of infectious diarrhea.

There is a marked difference in the rapidity with which these cases recuperate which is undoubtedly due to the prevailing low temperature during the summer and fall months. The sequellæ are less marked. The percentage of respiratory diseases is higher than that of diarrheal diseases, 16 in the registration area and 18+ in San Francisco.

DISCUSSION.

DR. LAWRENCE T. ROYSTER, Norfolk, Va.—Some of you may remember that six or seven years ago I read a paper on this subject in which I brought out that radiation bore a very important relation to diarrheal diseases in infancy and childhood. Dr. Lucas has brought out the relation between heat and relative humidity, but as far as I can remember I was the first to emphasize these points to any great extent. A humidity of from 85 to 90 per cent. on the Atlantic coast with a temperature of 100 is a nearly impossible condition, whereas in the arid regions a temperature of 102, 116 or 118° F. is no more uncomfortable because the relative humidity is only 4, 8, or 10. This brings out that radiation has a great deal to do with it. Lack of radiation may lower the resistance. We must realize in studying these cases that we must have a combination of climatology together with the history of the child's sickness. We must go back over the temperature and humidity curve.

Another point that Dr. Lucas has brought out is that we may have infectious diarrheas in the colder months. In the spring we often have a cool spell with a high humidity during which we will get a number of cases of infectious diarrhea.

Now with reference to the radiation, we send these children to the seashore where the relative humidity is greater than in town, but they do well at the seashore because there is always a breeze, which favors radiation.

Dr. Henry I. Bowditch, Boston.—There is one thing we must not lose sight of and that is the question of contact. Dr. Smillie's work last summer illustrates the fact that babies suffer more than adults from infectious diarrheas. In his group it was discovered that older people had an epidemic of infectious diarrhea in which he was able to trace the contact, and in considering diarrheal diseases it is only fair to consider this side of the problem. Dr. Smillie followed up the cases in his series from the epidemiological and bacteriological side. He found that where a certain organism was recovered from the movements of a child the blood of the whole family agglutinated that organism.

Dr. Jacob Sobel, New York.—We have found in New York that the primary mortality from summer diarrhea is due to high humidity. It is a common experience after several days of humidity, and it does not matter so much whether it is warm, that there will be an increase in diarrheal disease. Diarrheal disease is, however, easy to control; it has responded most easily to the means used to control it by the Health Department of this city. In 1903 there were forty-seven deaths per thousand births from diarrheal disease while in 1917 there were but seventeen per thousand births. The diseases now causing the high infant mortality are congenital conditions and respiratory diseases. We have also been trying to show that a large number of deaths are attributable to diarrheal disease in which the diarrhea is a terminal condition secondary to some other disease and should never have been listed as diarrheal disease *per se*.

Dr. Isaac Abt, Chicago.—I just want to ask Dr. Lucas if he will bring out one point that needs clarification. Are the diarrheas which we are meeting due to a single cause when the cause is not bacterial cause? May there not be a simple food basis for the diarrhea, as for instance if a baby is getting excessive fats may we not have a fat diarrhea? I think we should recognize the fact that there may be a large number of causes, and that one of the predisposing factors may be heat. I think we may say that many diarrheas are due to a poorly balanced diet and I would like to emphasize that point.

Dr. William Palmer Lucas, San Francisco.—I was not discussing the diagnosis of diarrheas or which of the causes was most important. The point Dr. Bowditch has made is important. In making an epidemiological study of diarrhea there are so few who can go into it thoroughly. Few can get an area where the cases are scattered, such an area as Dr. Kerley has pointed out the advantages of in his study of poliomyelitis in an isolated rural district. In practically every case of infectious diarrhea we have found that there has been more than one case in the same house. Practically all the deaths occurred in cases from institutions; there were practically no deaths in private homes.

With reference to Dr. Abt's question there are many opinions, but we know that there is a very definite type of diarrhea which is infectious; it may be due to some organism as the streptococcus, dysentery bacillus or what not. There is a large amount of diarrhea which occurred in connection with other diseases or which may be due to various causes as food intolerance, change of clothing, or a dozen different causes, but there are particular cases due to infections just as there are febrile cases due to typhoid fever.

Dr. Henry Dwight Chapin, New York, read a paper entitled

A COMPARISON BETWEEN CLINICAL EXAMINATION AND RÖNTGENOGRAMS IN DISEASES OF THE CHEST.

Owing to the difficulty of keeping little children quiet during exposure it is often hard to interpret heart shadows. A twisting of the body may cause such a rotation of the chest as to exaggerate the heart shadow in any direction. Fifteen cardiac cases have been studied in which a comparison was made between the *x*-ray findings and the result of the physical examinations. Of these cases seven showed an agreement, one partly agreed, and seven failed to show a correspondence in the conclusions reached by these two methods of examination. The interpreter of the röntgenograms considered that an early mitral lesion caused accentuation of the normal left auricular and pulmonic curves, producing a spherical or rounded appearance. It is difficult to distinguish by the heart shadows mitral stenosis from insufficiency, when either are present in only moderate degree. In regard to the lung a combined study of the physical signs and the *x*-ray pictures was made in ninety-seven cases. Among these there was a substantial agreement in seventy-seven cases and a disagreement in twenty cases. Of the latter five gave *x*-ray evidence of lobar pneumonias that were not detected by physical examination; two gave physical signs of lobar pneumonia which was not confirmed by the *x*-ray; three showed physical signs of bronchopneumonia not exhibited by the *x* ray. As a general rule it was found that the *x*-ray would often give a showing in the absence of physical signs in congestion, small consolidations, hilum infiltrations, interlobar pleurisy, miliary tuberculosis, and mediastinal tumors. The difficulty of making a diagnosis in hilum infiltrations and enlarged nodes is very great and in these the *x*-ray is very helpful.

A study of the transmission of voice sounds below the seventh cervical vertebra, known as Espine's sign, has considerable diagnostic value in diseased conditions at the root of the lung. A point that should be emphasized is that all cases of central pneumonia are in reality peripheral pneumonias. All so-called central pneumonias start at the periphery of the lung.

DISCUSSION.

Dr. John Lovett Morse, Boston.—Every one who uses the *x*-ray as an aid in the diagnosis of diseases of the chest in infancy and childhood is helped a great deal by it.

My experience is that the interpretation of the *x*-ray picture must be modified to a great extent by the experience of the clinician, since there are certain fallacies that must be taken into consideration. For instance, a solid area of lung behind the heart will not show. Another way in which the *x*-ray is unsatisfactory is in the diagnosis of small amounts of fluid in the pleural cavity. Large amounts are well shown, but the x-ray fails to show small amounts. I must say that except in very marked cases I am very careful in making a diagnosis of enlarged tracheobronchial glands from the x-ray picture. Where these glands are marked it is very different, but where they are not marked the observer may be very much influenced by whether he thinks he ought to find these glands enlarged or not. One of the most important uses of the x-ray in babies is in the diagnosis of miliary tuberculosis where we cannot find it in any other way.

I have been very much interested in the question of central pneumonias. So-called central pneumonias start at the periphery of the lung in the vast majority of cases, but I have had one or two cases in which they started as lobar pneumonia. In one or two cases the shadow was at the middle and later filled out.

DR. I. SETH HIRSCH, New York.—I wish to say a few words with reference to the x-ray in cardiac lesions. I would suggest considerable caution in drawing deductions from the shadows of hearts in children. Making a diagnosis of enlargement is fairly safe if a proper technic is employed.

In the diagnosis of pulmonary conditions in children not too great claims can be made. Several years ago I called attention to the fact that in cases of meningitis in which the signs were not sufficiently characteristic, that since in 85 per cent. of the cases of miliary tuberculosis the diagnosis would be sufficiently characteristic one could tell whether he was dealing with a tuberculous or a cerebrospinal meningitis.

I believe that pneumonia starts as a peripheral pneumonia and spreads down to the hilum.

DR. HENRY DWIGHT CHAPIN, New York.—In reply to the question whether the sign of dulness is earlier than the breath and voice sounds; in these cases there was very slight dulness that was very hard to interpret and the breath sounds were at first rather distant. Perhaps on the third, fourth or fifth day there would be plain bronchial breathing and this might be explained by the central process gradually working out. We cannot diagnose some of these cases by the physical signs and that is where the x-ray comes in, except that in the interpretation of the x-ray we must have someone who is exact and competent, and then we will find that it is of a great deal of help in such cases.

Second Day, Thursday, June 7, 1917.

DR. HENRY J. CARTIN of Johnstown, Pa., read a paper entitled

INTUBATION OF THE LARYNX.

An analysis of 350 cases occurring in my private practice is presented in the hope that the results obtained under most disadvantageous circumstances may lead to a more general use of this operation where hospital facilities are lacking. The conditions prevailing among the laboring classes in Johnstown were such as offered very few conveniences for operating. For an operating table we used the kitchen table, a bed, or two chairs. The light was always poor. Often the helpers failed. If the helper was a physician he was interested in the operation rather than in watching the patient. The lay helpers often failed through nervousness.

I employed O'Dwyer's instruments with a hard rubber tube and intubated with the child in the dorsal position. I always remove the string because if it is not removed the child must be restrained. Since this routine has been adopted only one patient has been lost by the child biting the string off.

As regards the use of antitoxin, 57 per cent. of the patients received from 10,000 to 20,000 units intramuscularly. Of these patients 226, or 65 per cent., had it before and after the intubation. Six cases had no antitoxin and were moribund when seen. After removing the tube I always remain with the patient until all danger of returning stenosis is passed. The tube was usually kept in five days and when left in this long there was usually less trouble than when it was removed earlier.

The diet depended upon the conditions in the home and the ability of the patient to swallow. I have never used the Casselbury method of feeding or resorted to gavage.

Caffein sodium benzoate was used for stimulation. Only one of these cases was intubated twice. Permanent disturbances of phonation did not occur in a single instance and there were no kidney complications in these cases. No case required tracheotomy. There were two cases that coughed up the tube and cast. The most fatal condition encountered in this series of cases was diphtheritic bronchopneumonia, which caused 56 per cent. of all deaths. The comfort of the patient depended upon how high up in the larynx the tube was placed. No case was lost in which intubation was performed early.

DISCUSSION.

Dr. John F. Hogan, Baltimore.—I have been much impressed by what was said in the first part of the paper regarding nursing. In my experience in various hospitals and training schools, it has been surprising the lack of intelligence that is shown by graduate nurses in reference to the care of infectious diseases. I think we should urge upon the University training schools the need of training nurses in the care of infectious diseases. We have often found the administration of antitoxin sufficient in these cases but one should not delay intubation. Some claim that by giving large doses of antitoxin we can do without intubation, but the antitoxin does not work quickly enough in laryngeal diphtheria to justify one in delaying intubation or not performing the operation.

Dr. H. L. Whitney, Plymouth, Pa.—I also practice in a mining district and have all sorts of nationalities with which to deal. I think that every case of stenosis of the larynx is not diphtheria, and that those caused by diphtheria are more amenable to treatment than those due to other causes. I prefer one very large dose of antitoxin to several smaller ones on account of the danger of anaphylaxis. In a child three or four years old I give 15,000 units.

As to the feeding I give liquids, of course. In giving milk it is possible that a drop may get into the tube and block it so it is advisable to give a drink of water after giving milk.

I disagree with the statement that extubation is easier than intubation. I had one of the original O'Dwyer sets and found great difficulty in making the curve of the pharynx, so I had a tube made one and one-half inches shorter. An ordinary intubation is not a a very difficult operation but every physician is afraid of it and he does not put the tube down far enough.

Dr. A. J. Bell, Cincinnati.—Like Dr. Hogan my experience has been in hospital work. I think this is a very remarkable series of cases. It is unusual to have so many cases in private practice and also to have such good results. Among the cases we see in hospitals there are many instances in which the tube is coughed up. I have had one death from coughing up the tube. All agree that the hospital is the ideal place for such patients because there they receive proper attention. I think the subcutaneous method of administering antitoxin has been given up entirely and only the intramuscular and intravenous methods are used.

Dr. Isaac A. Abt, Chicago.—I think the Section is to be congratulated on this paper. It emphasizes a point known for a long time and that is that the men who do the largest number of intubations are not the specialists in nose and throat but the men in general work. I think this is a remarkable series of cases, and shows remarkable results.

With reference to the position of the patient during the operation, I have intubated patients in the sitting and recumbent positions and it always seems to me the position of the head is more favorable if the patient is sitting up. Dr. Northrup said the head should be in a position as though it were hung up, as in this position the tube is more easily introduced.

As to using a slightly larger tube, many patients do not die from intubation but from traumatism during intubation or extubation. One may use a tube that fits snugly but not one that fits too tightly. We ought not to say that the operation is easy, either intubation or extubation, because this is not true. The operation requires a great deal of practice and great dexterity. Young babies under one year do very poorly under intubation and the largest number of them die.

Intubation in scarlet fever does not offer as favorable a prognosis as in diphtheria. In a rural district is it better to operate early, if there is only dysphonia, retraction of the chest and cyanosis. One of the men spoke of using force in introducing the tube. One should use no more force in introducing a tube than though he were putting his finger in a patient's eye.

Dr. Lawrence T. Rotyser, Norfolk, Va.—There is a vast difference in performing an intubation inside and outside of a hospital. I was trained in Willard Parker Hospital to doing the operation under approved conditions and going out into private practice found that one had to do the operation under very different conditions. I get practically all the intubations anywhere in my locality and I rarely do more than seven or eight in a winter, so I think Dr. Cartin's series is remarkable. It is undoubtedly better to put in a tube unnecessarily than to delay too long in putting one in.

Performing about seven or eight intubations a year I have had in eighteen years two deaths.

He who uses force in introducing a tube does not know how to intubate; the utmost gentleness is required for the sake of the patient. Intubation is a major operation and the man who is inexperienced had better do a tracheotomy. In operating I prefer the supine position.

Dr. John F. Hogan, Baltimore.—No man should attempt to perform an intubation until he has practised the operation on the cadaver.

Dr. J. P. Crozer Griffith, Philadelphia, read a paper entitled

THE WEIGHT OF THE CLOTHING IN THE FIRST FIVE YEARS OF LIFE.

Many observations have been made with reference to the weight of children during the first year of life and again from school age onward, but between these two periods a hiatus exists. I have been impressed by the fact that the weighing of infants and of subjects past the age of infancy nearly always has to be done with the clothing not removed, therefore it would be a matter of great convenience to know what the average weight of the clothing is at the various periods of childhood. The weight of the clothing at six years has been estimated as 2.1 pounds, at eight years 4 pounds, at ten years 6 pounds. The ratio of the clothing to the weight of the normal child dressed, at these ages, was therefore about 6 per cent. for girls and 7 per cent. for boys. We made a series of weighings of 222 children under five years of age, dressed in average clothing. The weighings were made in the autumn, between seasons when an average amount of clothing was more likely to be worn. Some of the children as they presented themselves were very much underdressed and others were very much overdressed. These were excluded from the list leaving 194 children upon which the final estimates were based. One could ignore the difference in the ratio of the clothing in the sexes at this early age. The following table shows the weight of the clothing at the various ages:

Age	Weight of clothing	Ratio to weight of normal dressed child
Birth to three months	1¾ pounds	16 per cent.
Three to six months	1¾ pounds	11 per cent.
Six to nine months	1¾ pounds	10 per cent.
Nine to twelve months	1¾ pounds	8 per cent.
One to two years	2 pounds	8 per cent.
Two to three years	2 pounds	6 per cent.
Three to four years	2 pounds	6 per cent.
Four to five years	2½ pounds	6 per cent.
Five years	2½ pounds	6 per cent.

This holds only for normal children. The difference in the weight of the clothing of the sexes is negligible up to six years.

DISCUSSION.

Dr. Frank C. Neff, Kansas City.—I think the effect of Dr. Griffith's paper will be very good since it calls attention to the fact that most children are overdressed. This paper will form a basis upon which one will be able to advise parents how much clothing children should wear. It is very important that we should have some idea how much clothing a child really should wear.

Dr. J. P. Crozer Griffith, Philadelphia.—The question of arriving at an average was looked after by experienced nurses; if a child was overdressed or underdressed she had the amount of clothing adjusted so that it approximated the average before the child was weighed. The children were weighed without hats or outside wraps.

Dr. John Lovett Morse, Boston, read a paper entitled

EDEBOHL'S OPERATION IN NEPHRITIS IN CHILDHOOD.

Edebohl's first presented this operation in 1898. From a study of his work and the literature upon it the explanation of the good results obtained by decapsulation of the kidneys in nephritis with suppression of the urine and symptoms was as follows: Under these circumstances the kidneys are in most instances engorged with blood. As a result of this engorgement the kidney became enlarged. The capsule stretched to a certain extent, but after a time further distention became impossible and the circulation became so much impeded that excretion of the urine was impossible. The relief of the tension afforded by the decapsulation results in a diminution of the engorgement of the kidneys and improved circulation and in favorable cases a restoration of the excretory function. It is possible that a simple incision might be as effective as decapsulation, but it does not seem likely that it would be. It is possible that manipulation is responsible in part for the relief of the congestion and starting up the excretion. Decapsulation does not remove the cause of the disease, but simply relieves the acute congestion which is in many cases the cause of the threatening symptoms, and with this exception leaves the kidney as it was before.

Decapsulation should be done in acute nephritis, therefore, only when there is a very marked diminution in the amount of urine and symptoms of intoxication are developing; under these circumstances it is frequently a life-saving operation.

The writer has collected nineteen cases from the literature and adds four cases of his own in which this operation has been performed. All the cases were going from bad to worse under medical treatment and would undoubtedly have died. Apparently as a result of the operation two have been permanently cured, another was well for two years, another died of nephritis in no way connected with the previous illness; two others were apparently well but were not under observation long enough to say definitely that they were cured. Nine others were improved by the operation.

The following conclusions seem justified: Edebohl's operation is of much value in properly selected cases of nephritis in childhood. It may save life and result in permanent cure in acute nephritis. No child ill with acute nephritis should be allowed to die without giving it the advantage and chance afforded by this operation. It may prolong life for considerable periods in a not inconsiderable number of cases of chronic nephritis and may possibly in rare instances result in cure. It should always be considered in all cases of chronic nephritis in childhood which are not doing well under individual treatment.

DISCUSSION.

Dr. Frank X. Wall, Chicago.—Last summer my attention was directed to a case of this kind. The case resembled a cardiac case and then later showed renal decompensation. I saw this child two or three times and then it died. I also had a small boy of three years who was benefited by this operation and apparently recovered. We know very little of the pressure relations between the glomeruli and tubules but if the clinical results show that this operation is valuable we should employ it even though we cannot explain the pathology.

The puerile kidney withstands many infections; it has an immunity such as is possessed only by the kidney of the pregnant woman.

We should determine some sort of criterion whereby we may judge when Edebohls' operation is to be used and when discarded. I had a case in which there was much albumin and casts in the urine and general anasarca and edema, in which a resection of the kidney was done. I hope to add this to Dr. Morse's twenty-three cases later on.

Dr. John Lovett Morse, Boston.—I want to emphasize that there is a difference in the indications for the operation in acute and chronic nephritis. In acute nephritis the operation tends to relieve the congestion temporarily and tides the child over so that it will have a chance of recovery. In chronic cases there seems to be no reason why we should expect good results except that experience shows that a certain number of cases are benefited by the operation, and occasionally a case is cured and in some instances life is prolonged.

Dr. Julius H. Hess, Chicago, read a paper entitled

DIAGNOSIS OF THE AGE OF THE FETUS BY RÖNTGENOGRAMS.

The lantern slides presented show the centers of ossification from the sixth week of fetal life to full-term. A reliable method of determining the age of the fetus would be found helpful in many conditions. The bones are the only structures of the body suitable for this purpose. The fetus shows no ossification centers until the sixth week, and these centers of ossification are not shown until the seventh week by the *x*-ray. The centers first shown are those of the clavicle and mandible; that in the clavicle is visible first but during the same week, while that in the mandible appears during the same week or early in the following week. Between the seventh and eighth weeks there is a veritable shower of new centers, seen in the maxilla, in the fifth, sixth and seventh ribs on each side, in the humerus, the ulna, and lastly in the femur; usually also in the tibia and fibula. In the ninth week the centers begin to appear in certain of the spinal processes. The centers in the phalanges of both hands and feet appear between the eighth and tenth weeks, and also those in the metacarpal and metatarsal bones. At this time some of the bones of the skull begin to show ossification centers, usually the basal portion of the occipital and the lateral portion of the sphenoid, and the axial skeleton began to develop. The lower extremities and the metatarsals and phalanges developed much less regularly than the upper extremities. From the thirteenth to the sixteenth weeks centers could be seen in all the axial skeleton and all the small bones of the hands and feet, except the middle row of the metatarsal bones. The pelvis first showed two centers in the sacroiliac bones which were noticeable at about the tenth week. The pelvis is very well developed by the seventeenth week. From this time on the changes are those of structure rather than number. In the rudimentary milk teeth the process of ossification begins at about the twentieth week, showing first in the lower incisors. From the twenty-first to the twenty-fourth week ossification starts in the tarsal bones and the os calcis. From the twenty-fifth to the twenty-eighth week centers of ossification may be seen in all the milk teeth. The center in the astragalus and in the transverse processes down to those of the last lumbar vertebræ appear from the twenty-eighth to the thirty-second week. Two centers, one in the head of the tibia and one in the first coccygeal, are usually not present at birth.

By a study of the ossification centers one may be able to tell the age of the fetus within one week during the first one-half of pregnancy, and a little less accurately during the second half of pregnancy. The development is much more constant in the upper extremities than in the lower. The further away from the head one goes, so far as the axial skeleton is concerned, the less reliable are the centers of ossification as an index of the age of the fetus. The x-ray method of determining the age of the fetus is much more reliable than that based on the length and other measurements of the fetus. The x-ray method is capable of much more refinement by further study and observation.

DR. ALBERT G. MITCHELL and DR. J. CLAXTON GITTINGS, Philadelphia, presented the following paper which was read by Dr. Gittings:

PHENOLSULPHONEPHTHALEIN ELIMINATION IN INFANTS AND CHILDREN.

The value of these tests for kidney function have been thoroughly established by Roundtree. So far as prognosis is concerned, if there is only a moderate reduction in phthalein excretion the prognosis is favorable. The test was applied to seventy-five patients in the Children's Hospital who were suffering from a variety of diseases. There were nine cases of true nephritis. The technic used consisted in a combination of that described by several authors. This the authors now deplore but cannot change as they do not wish to lose the cases. The older children passed their urine before the tests were made but the younger children were not catheterized unless there was an obvious retention of urine. The children were placed in Bradley frames and 3 milligrams of phthalein instead of the adult dose of 6 milligrams was employed intramuscularly. The estimations were made of the two-hour excretion following the injection of the phthalein. In a group of acute infectious and miscellaneous diseases and pyelitis there was no marked diminution in the phthalein excretion except in two cases of tuberculous meningitis. One of these gave less than 5 per cent. excretion and lived five days afterward. One case of pernicious anemia gave an excretion of 65 per cent. In this group of cases the proportion of phthalein excreted in the first and second hours was proportionately as great as in adults. These observations have also confirmed those made on adults namely, that phthalein excretion is not decreased except in renal disease and also that, as in adults, a preliminary catheterization is not necessary. For purposes of comparison it would be advisable to adopt and maintain a standard method of making these observations. The injection of 6 milligrams into the lumbar muscles in adults and 3 milligrams in children is a satisfactory method except in cases of extreme edema, where the muscles cannot be used.

DISCUSSION.

DR. JEROME S. LEOPOLD, New York.—About a year ago the results of our investigations were reported. We came to practically the same conclusions as Dr. Gittings. We used 6 milligrams of phthalein and did not catheterize the patients but collected two-hour amounts. In normal individuals we found the excretion for this period from 50 to 90 per cent. and we considered any figure under 50 per cent. as a below normal. We found that for individual cases, as in acute nephritis, we usually got better and more definite results with the phthalein test than with the examination of the blood. We have compared the result of the two tests and think that both are necessary in almost every case.

How do you make the phthalein test in children with extreme edema and what have been your results in those cases? Do you give the phthalein intravenously?

DR. JOHN LOVETT MORSE, Boston.—We have been doing the phthalein tests at the Children's Hospital in Boston. There is no use in getting the urine at the end of one hour it is perfectly satisfactory to get it at the end of two hours. The amount of urine passed at night should be compared with the amount passed during the day; this is perhaps as important a test of function as anything we have.

Dr. J. Claxton Gittings, Philadelphia.—We have not had any cases with marked edema. However, the men I have been working with say that in case of edema the injection must be made deeply into the muscles or else given intravenously. I have been struck by the fact that the technic of making the test as developed by different authors gives very different results. If a comparison of results is to be of any value the method employed must be precisely the same. The necessity of absolute accuracy in the technic must be emphasized.

(To be continued.)

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Twenty-ninth Annual Meeting, White Sulphur Springs, W. Va., May 28, 29, 30, 1917.

The President, Dr. Frank Spooner Churchill, *Chicago, in the Chair.*

(Continued from September.)

THE TREATMENT OF SECONDARY ANEMIA IN INFANTS BY BLOOD TRANSFUSION.

Dr. Charles Gilmore Kerley, New York.—The cases included in this report were referred to the writer because of simple secondary anemia or because of anemia and malnutrition. Various food combinations had been tried and all had received medical treatment for the anemia. The transfusions were made at the Babies' Hospital. The blood of the donor was proven fit by the absence of agglutination and hemolysis. The technic employed consisted in cleansing and cocainizing the skin over the median basilic vein of the child's arm and exposing about 2 cm. by dissecting it free from surrounding tissues. A small opening is made into one side of the vein with a pair of scissors and a Lindeman needle inserted. The vein below the needle is then tied off and another suture is placed over the vein and needle to hold the needle in place. A small amount of sterile salt solution is introduced to make sure that there is no leakage. A rubber tourniquet is placed on the arm of the donor and the skin cleansed over the most prominent vein and the blood drawn with a record syringe until it is full. This syringe is then handed to the operator working on the child and the blood inserted into the child's vein. At the same time a fresh syringe full of blood is being obtained from the donor. Each syringe is well washed out with sterile salt solution before being used again to collect blood. This procedure is continued until the required amount has been transfused.

There were eight cases in the series and the blood examinations before and after the transfusion show the effect of the transfusion in each instance. The results in all but one of these cases were satisfactory. One case was transfused twice and in each instance there was an improvement as shown by the blood examination, but it failed to hold longer than a few weeks. The abdomen in this case was greatly distended not unlike Hirschsprung's disease. In the other cases there was no return of the anemia and subsequent growth and development was all that could be hoped for. The children were all under two years of age. I have tabulated the weight increase and the blood findings, but the table cannot record the magical change in the patients, the change from sickly, whiny infants into happy apparently well infants. These patients were transformed from those with a digestive capacity barely able to maintain existence, into those that took on the normal constructive processes of early life.

DISCUSSION.

Dr. Hoobler, Detroit.—I should like to ask what method transfusion was used. Were more than two transfusions given? Were there any cases of von Jacksch's anemia? Had you any case of secondary anemia?

Dr. Herrman.—Whose blood did you use?

Dr. Kerley.—The cases were all simple anemia, some apparently anemic from birth. All showed malnutrition. The technic is described in my paper. One transfusion was used in each case, except the one that did not do well and that was transfused again after a thirty-day interval. The donor was usually some relative, the mother or the father and in one instance an aunt.

THE VALUE OF THE VON PIRQUET TEST AS CONTROLLED BY AUTOPSY FINDINGS.

Dr. H. H. Mason Knox, Jr., Baltimore.—The object of this paper is to report the results of a study of the von Pirquet test for tuberculosis upon a series of children who have died and upon whom careful autopsies have been performed. This investigation was carried on at the Harriet Lane Home of the Johns Hopkins Hospital in the service of Dr. John Howland. Careful autopsies were performed on 324 infants and children, from birth to twelve years of age. Sixty-eight cases were found to have tuberculous lesions on postmortem examination, that is about 20 per cent. of the fatal cases examined after death. Two hundred and fifty-six or 80 per cent. were found at postmortem examination to be free from tuberculosis. This incidence of tuberculosis in infancy and childhood agrees with the results of Veeder's investigations, and is much smaller than is reported in European centers. As has been repeatedly found, the number of tuberculous cases increased rapidly with the age of the patient. Koch's old tuberculin, undiluted, was used and the scarification done by the borer devised by von Pirquet. Readings were made in twenty-four and forty-eight hours. In the twenty-five cases having no tuberculous lesions at autopsy, the test was never positive, but negative without exception. It should be emphasized that no doubtful cases should be called positive, but the test repeated; only those should be called positive in which there is a marked contrast between the tuberculin-treated areas and the control site. This result seems to furnish most reliable confirmatory evidence among American children that a properly performed negative von Pirquet reaction, except in extremely ill children, precludes the possibility of tuberculous infection.

Of the sixty-eight cases in which tuberculous lesions were found at autopsy, the von Pirquet reaction was made in sixty-one; of these it resulted positively in forty-five cases, and negative in sixteen. In twelve of these latter the patients were suffering from rapidly advancing widespread miliary tuberculosis; in two instances from tuberculous meningitis; in two from pulmonary tuberculosis of advanced stage with cavity formation, and in one instance from tuberculous peritonitis. In all instances the test was made from a week to a few days before death, usually several weeks after the onset of illness. It can fairly be concluded from our figures that a positive cutaneous test indicates the presence of a tuberculous lesion, but that a negative test in patients extremely ill may frequently fail to react positively.

The tabulation of the tuberculous cases shows that forty-four of the sixty-eight cases are colored, and twenty-four white; of seven fatal cases under six months, five are colored and two white. These results would strengthen the view that tuberculosis is much more prevalent among the black than among the white races, in proportion to their numbers and that tuberculous infection occurs at an earlier period of life in the black. It may be concluded that the cutaneous test with tuberculin, as described by von Pirquet, is a most reliable aid in the detection of tuberculosis in children; that a positive reaction invariably indicates a tuberculous focus and a negative reaction establishes the fact that there is no tuberculous lesion except in extremely ill patients in whom the diagnosis could easily be made by physical examination.

DISCUSSION.

Dr. Charles Hunter Dunn, Boston.—We have been carrying out investigations similar to those just given. We have been greatly helped by the fact that all infants dying in the hospital are autopsied and every case that comes into the hospital has been examined with the *x*-ray and given the von Pirquet test. We have had somewhere between 200 and 300 autopsies. Our figures are somewhat different from those just given but this may be explained by the fact that our children are all under two years of age. The incidence in all babies has been over 50 per cent. The percentage of persistently negative reactions has been 30 per cent. Not more than one or two cases in the entire series showed a positive reaction with negative findings at autopsy.

One thing that strikes us is the great variation that appears in all statistical studies in every respect. It seems to me that this variation can only be accounted for by the fact that the disease varies much in incidence and manifestations from time to time. There are periods in which we see certain typical manifestations and a certain incidence of the von Pirquet. These periods are longer than one year; perhaps five or ten years may go by and then a period will follow in which another peculiarity in the manifestation of the disease will become apparent. To get statistics of value it seems to me we would have to cover 100 years and study a million cases.

DR. L. EMMETT HOLT, New York.—It has been our experience that it is very exceptional to find a positive reaction and not to find tuberculosis at autopsy and the reverse is also true. The only exceptions we have found are those Dr. Knox has given. We hear it said that in tuberculous meningitis it is exceptional to find a positive von Pirquet reaction; we have found a positive reaction in tuberculous meningitis except in cases that were practically moribund. We find that the von Pirquet test gives a positive reaction quite regularly in other forms of tuberculosis in children.

DR. ISAAC ABT, Chicago.—We are assuming that all should get the same reactions, but it should be remembered that all are not using the same tuberculin. We should require of every man who makes these tests that he should use the same kind of tuberculin that others are using. There is no standard tuberculin. The different tuberculins are not of the same strength. Before we compare our results from the von Pirquet test we should standardize our technic and fluids, and demand that every man use the same fluid and the same technic and then we would have a better basis for the comparison of results.

DR. SAMUEL McC. HAMILL, Philadelphia.—My experience has been exactly the same as that of Dr. Abt. I find we get the same reaction each time if we use the same tuberculin. Using a certain tuberculin and making the three tests, the conjunctival, the Moro and the scarification, we have had 60 per cent. positive reactions.

My experience with the test in tuberculous meningitis has been like that of Dr. Holt. I have obtained a positive reaction within twenty-four hours of death in tuberculous meningitis. I cannot agree with Dr. Knox in the statement that mild reactions should be regarded as negative.

DR. ALFRED F. HESS, New York.—For the past two years we have been studying this question at the Infant Asylum. The work is being done by Dr. Bass. Three von Pirquet and three intracutaneous tests are made within twelve days. With these short intervals I think there is no danger of bringing on a susceptibility. At times we get no reaction after one test, more of a reaction after the second, and still more of a reaction after the third test. Quite a number of children that give a negative von Pirquet reaction give a positive intracutaneous reaction. These tests may explain some of the differences in the reports we have been getting. Some cases tested out of the hospital that gave a negative reaction were given a second test when they came into the hospital and then reacted positively. When we give the three tests, the von Pirquet, the Moro and the conjunctival, the number of positive reactions is surprisingly large. I do not believe that one negative von Pirquet reaction means that there is no anatomical tuberculosis present.

Dr. Heiman, New York.—I want to enter a word regarding the technic employed in making the von Pirquet test. This is not needed by the members of this Society, but many physicians vitiate the test. The original intention of von Pirquet was that this should be a local test. I have seen an arm scratched until a blood-vessel was opened. That is not a von Pirquet test. The borer is the only instrument that should be used. We want to have a slow resection, so that the antibodies come to the surface and there come into contact with the tuberculin and form the reaction.

Dr. Charles Hunter Dunn, Boston.—I cannot believe that the great variation in the results that we get can be due to a difference in the tuberculin of the technic in making the tests. It is because the disease itself normally shows variations. I have had infants in the hospital and have tried every kind of tuberculin and have made intracutaneous and subcutaneous tests without getting reactions for a certain time and then a period would come in which we obtained a large percentage of positive reactions. We would get a very high percentage of positive reactions for a period in cases that showed the same clinical manifestations and then over another period with different clinical manifestations, a high percentage of negative reactions. The tubercle bacillus is very peculiar and the defense of the hosts reacts differently to its variations. I consider that the difference in the results that are shown by various investigators are due to this rather than to a difference in the tuberculin or the method of making the tests. The percentage of persistently negative reactions corresponds to Dr. Holt's findings of 60 per cent. positive reactions.

Dr. J. P. Sedgwick, Minneapolis.—We have been making these tests on the new-born. We had one baby which showed a questionable reaction and upon thorough investigation we found that the mother was tuberculous. Regarding the repeated reactions we have been working with known antigens devised by Dr. Larson, making one von Pirquet test, then a second von Pirquet, then an intradermal test and also a complement deviation test. We have been getting about the same number of reactions with the complement deviation test as with the intradermal, but this will be reported later.

Dr. J. H. M. Knox, Baltimore.—In many of the cases we used the intradermal test also, and in a large series they were confirmatory of the von Pirquet tests.

THE EFFECT ON HUMAN MILK PRODUCTION OF DIETS CONTAINING VARIOUS FORMS AND QUANTITIES OF PROTEIN.

Dr. B. Raymond Hoobler, Detroit.—Our knowledge of the proper diet for nursing mothers whose milk supply is not sufficient or is failing, is inadequate. The present study attempts to determine the effect of diets containing various amounts and kinds of protein on the production of human milk. What is the minimum amount of protein that should be fed to protect maternal tissues, that is, what nutritive ratio should exist between the protein on the one hand and the carbohydrate and fat on the other. Is there any difference between animal and vegetable proteins in their effect on milk production? If so, which are best? Is one kind of animal protein better than another to protect maternal tissues? In this investigation some twelve different diets have been tested. The results obtained from a purely vegetable diet suggests the futility of excluding from the diet at least a certain amount of animal protein. Many mothers are trained during the latter part of their pregnancy to eliminate albuminous food from their dietary because of albuminuria. The fear that albuminuria may persist causes these women to continue a low protein diet which frequently is the cause of a failing milk supply. In summarizing we may say: 1. A nutritive ratio of one to six or narrower seems best adapted to the need of nursing mothers. This ratio refers to the proportion of digestible protein to digestible fat and carbohydrate, the latter reduced to a carbohydrate basis. 2. Animal protein is more suitable than vegetable protein in supplying nitrogen for milk and maintenance of the nitrogen balance. 3. The protein when derived from nuts and when fed with other vegetable protein is suitable for supplying milk protein and for maintaining nitrogen balance. 4. A diet composed exclusively of cereals, fruits and vegetables does not supply sufficient protein for elaborating milk protein and causes a severe drain on the tissues of the mother. 5. Of the various forms of animal protein, that derived from cow's milk seems particularly suitable for the production of human milk protein as well as for the preservation of maternal tissues. It was found that a diet that would just maintain the nitrogen equilibrium was in many respects preferable to one which tended to add weight.

DISCUSSION.

DR. HENRY J. GERSTENBERGER, Cleveland.—I would like to ask Dr. Hoobler how many mothers he had on these diets and whether the ages of the mothers and their weights were somewhat similar. I would also like to know how he determined the amount of milk these mothers produced and what method was used for the analyses.

DR. ISAAC ABT, Chicago.—I am not in a position to criticize these figures but the matter is not as simple as it is represented to be. I would like to know about the weights, ages and races of these mothers and about their physical condition. You know that one little woman that weighs scarcely 100 pounds will produce 100 ounces of milk whereas another great stout woman will increase in weight and produce very little milk. One woman may be emotional and live in luxury and produce no milk, while another may live in poverty and produce an abundant supply. It is said that during the siege of Paris more mothers nursed their babies. I do not think this was a question of diet. This problem is not simply one of feeding a certain amount and kind of food and getting a definite production of milk.

Dr. David M. Cowie, Ann Arbor.—What was the effect of the diets on the fat percentages in the milk? It is a well-known fact that we can stimulate the activity of the breast if we increase the amount of meat in the dietary. This fact is so well known that we use it in our class-room work.

Dr. Alfred F. Hess, New York.—From the general point of view we must consider that although animal protein produces more milk, yet the animals that produce the most protein in their milk get no animal protein in their food. An animal getting no protein in its food will produce a milk with two or three times as much protein as human milk produced on a diet containing animal protein.

Dr. Thomas S. Southworth, New York.—One of the most important factors in furnishing a mother with a sufficient amount of protein is that the quantity should be sufficient so that she does not draw on her own tissues. We have been told that the diet affects very little the production of milk. That has not been my view, though my view may have a rather empirical basis. It is a very common occurrence to have mothers present themselves who did not want to nurse their infants because it runs them down and yet if they have a diet made up of carbohydrates and a sufficient amount of milk, they do not run down during lactation, but on the other hand have a tendency to put on flesh. If the quality and quantity of the mother's milk depends upon the mother's physical condition then a diet that does not draw on the nitrogen of the mother's tissues is a very important matter.

Dr. L. E. La Fetra, New York.—I wish to ask the same questions as D. Gerstenberger has asked. I would also like to know whether Dr. Hoobler tried these same women on other diets. Cows differ in the amount of milk they give and it is only reasonable to believe that women differ in the same way. Did you take any of these efficient or inefficient women and put them on different diets and in that way find whether the differences you have shown were due to the diets or to the women?

Dr. Hoobler, Detroit.—There were in all eight mothers under observation for a period of three months. What I have presented represents only a part of the material that has been collected. A few of the mothers were carried through the whole period. A few of these mothers were on the nut diets and also on the other ten diets so that we have a variation of diets for these mothers. One weighed 120 pounds and another 140. The diets were not based on the per kilo body weight; they all had the same quantity. I used the old standard and fed according to calories, using about 3000.

The milk was obtained by hand milking under the supervision of a nurse and the breasts were emptied every four hours. The fats in the diets varied. The nut diet had the highest amount of fat 3.7

per cent. The ages of the mothers were about thirty years and these were their first babies.

LUETIC NEPHRITIS IN INFANCY AND CHILDHOOD.

Dr. William W. Butterworth, New Orleans.—Not infrequently instances of nephritis are met with in infancy and early childhood for which no etiological factor other than congenital lues can be reasonably ascribed. A search of the literature shows that apparently little recognition is given to luetic nephritis by English and American writers. More than twenty-five years ago French authors gave it a distinctly cylnical etiology in the nephropathies. German writers have studied the subject from both the clinical and pathological side and have made painstaking and extensive contributions to the literature. Latterly Italian observers have made valuable additions to our knowledge. Karvonen's exhaustive summary and work, in 1900, gave stimulus to further and more extensive clinical observations. While there is a lack of agreement in regard to the severity of the syphilitic infection and its effect on the kidneys, upon two points there is a more complete understanding. First, the clinical symptoms of nephritis in hereditary syphilis may be wanting, or so insignificant as to pass unnoticed. Repeated examinations of the urine may be necessary to establish a diagnosis. Second, if the child survives the early period of life, then the clinical manifestations are those commonly associated with a chronic interstitial nephritis. From my own clinical experience and from a study of reported cases, it can be said that congenital luetic nephritis presents nothing unusual in its clinical manifestations; that each case is modified by its own individuality, and conforms more or less to certain classifications or types, as follows: 1. Acute parenchymatous nephritis which may be hemorrhagic. 2. Acute interstitial nephritis. 3. Chronic interstitial nephritis. 4. Myeloid degeneration. 5. Gummata of kidney. Fetal syphilis may result in various kidney changes such as congenital malformations, cystic kidney and nephritis. Infants and children who present clinical evidences of an hereditary syphilitic nephritis during life usually do not show gross macroscopical changes in the kidneys. However, almost without exception abnormal and characteristic histological findings are found in these cases. Several observers have recently demonstrated active, well-formed Treponema pallidum in the vascular, interstitial and parenchymatous renal tissues. The cells of these tissues when attacked by the Treponema present a progressive phase of cell degeneration. The organism may be found generally diffused throughout the kidney or may be localized. These observations support Karvonen's toxic theory, and form a reasonable hypothesis for the complex clinical manifestations and diverse urinary findings in the kidney changes of hereditary lues. A preponderance of organisms either by the vascular, interstitial or parenchymatous tissue, combined with the extent of involvement and with a diffusibility or localization of organisms, may explain the individual tendency to certain types of nephritis. Living active Treponema pallidum have been found in the urine of a four months' baby dead of congenital syphilis. The urine of congenitally syphilitic children contains a specific poison, probably an alkaloid, which when injected into animals causes death. Castaigne in 1913 called attention to a familial albuminuria dependent on hereditary syphilis. He reports twelve personal cases of albuminuria in children. These occurred in four families. All had positive Wassermann's. Two of the children died of nephritis, the other ten were apparently cured by specific medication. Congenital syphilis is often not the only cause of family albuminuria. Judicious specific medication is curative in most of the cases. Congenital luetic nephritis is not generally recognized as having a distinct etiological basis.

DISCUSSION.

Dr. J. P. Crozer Griffith, Philadelphia.—We have had at least one case of this kind reported a few years ago. Therapeutically there seems to be such a thing as syphilitic nephritis.

THE EFFECT OF COD-LIVER OIL IN INTESTINAL INFANTILISM.

Dr. L. Emmett Holt, New York.—The case upon which these observations were made was a girl eight and one-half years of age suffering from infantilism, apparently due to chronic intestinal indigestion. Metabolism observations were made at the beginning and at the end of a period of treatment during which cod-liver oil was administered. The metabolism at the beginning of the period showed negative balances in calcium, magnesium, phosphorus and total ash. At the age of eight and one-half years the child's net weight was 27½ pounds and her height 39 inches. Under the administration of cod-liver oil she gained in nine months 2½ inches in height and 13½ pounds in weight. Metabolism observations at the end of this period showed marked positive balances in calcium, magnesium and total ash.

Dr. Fritz B. Talbot, Boston.—These figures are very striking and look very conclusive. There are two points of interest. The one is the negative balance during the first period and the fact that there could not have been a negative balance all the time. It seems, however, that a negative balance must have been present more of the time than it was absent.

Another point of interest is that even with the cod-liver oil the absorption of available nutrition was only 66⅔ per cent., whereas under normal conditions it is 90 per cent. Under the best conditions in this case the retention of available nutrition was below normal.

Dr. Charles Herrman, New York.—This case well illustrates the point that growth in height and gain in weight do not necessarily go hand in hand, and that one may have a gain in one without a corresponding gain in the other.

Dr. Raymond Hoobler, Detroit.—This child was also fed malt. I would like to know what Dr. Holt thinks was the effect of the malt in this case. If he used one-third oil and two-thirds malt might not a part of the effect be due to the malt.

Dr. Holt.—It is quite possible that the malt may have had something to do with the gain. I have considered this point in my paper but did not read it.

We have confirmed the finding that in rachitic cases there is an increase of from 25 to 40 per cent. in the amount of calcium retained by the administration of calcium salts and have thus demonstrated the value of calcium in rachitis.

Dr. Talbot has spoken of the negative balance. The child could not have had a negative balance all the time. There had, however, been no gain in weight for four years previous to the administration of the cod-liver oil. Just how much of the gain was due to the cod-liver oil it is hard to tell, because simply an increased intake of salts would cause an increased retention. However, we have concluded that the cod-liver oil was a large factor in the gain.

INDICANURIA IN CHILDREN.

Dr. H. M. McClanahan, Omaha.—An extensive search of foreign literature and also of that of this country shows that many authors make no mention of it while others devote perhaps a page or less to it. The natural conclusion is that the subject is not of any importance. Indican of intestinal origin is found in the urine of children in the following conditions: constipation, chronic intestinal indigestion, duodenal and peptic ulcer, malignant growths and in all forms of acute obstruction of the bowels, as volvulus, ileus and intussusception. Second, indican is produced in suppurating cavities within the body. In empyema, pulmonary abscess, bronchiectasis, pulmonary gangrene, chronic tonsillitis, appendicitis and in general pyemic conditions.

The writer has made a careful study of his office cases, including the records of the years 1913 and 1916 inclusive, having kept notes on 1657 urine examinations. Many of these were in children suffering from some organic disease. In a number but one examination was made. Indican was found in 1341 examinations and was absent in 316. In many cases there was found only a trace. The urine of 536 children varying in age from four to twelve years was studied, none of whom had any organic disease. All cases were eliminated from the list where other abnormal products were found. The test for indican uniformly employed was hydrochloric acid, C. P., 30 minims; nitric acid, one minim; urine, 10 minims; and chloroform up to 15 minims. The amount of indican present was determined by the intensity of the color. Of this series of cases twenty were hospital cases six of which were suffering from empyema. All were subjected to operation. Indican was found in excess in all cases. In five that recovered indican either disappeared or there was only a trace when they left the hospital. One of the cases terminated fatally. There was one case of pulmonary abscess in which indican was constantly present. Three cases were of acute appendicitis and in these indican was present but disappeared after recovery. Indican was present in one case each of duodenal ulcer, acute ileus, and one case of pyonephrosis; in two cases of bronchopneumonia, and two cases of typhoid fever. In the 516 ambulatory cases indican was present in greater or less degree. In ninety-seven there was a trace of indican, and in 367 indican was present in excess; in fifty-two the urine was loaded with indican. Medical advice was sought in these cases for such reasons as the following: constipation, indigestion, bad breath, poor appetite, excessive appetite, restless sleep, bloating, coated tongue, irritability, worms, sallow complexion, enuresis, mental dulness, vertigo, foul stools, headache and liver trouble. In a large number of the older children there was evidence of bad teeth. Nearly all of the group had some form of indigestion. Of the 516 cases 337 on a second examination showed either decrease or absence of indican and in the remaining 179 cases indican persisted. Of the fifty-two cases showing excessive indican, all were cases of constipation. In three cases in which the indican persisted after careful dietetic and hygienic treatment the *x*-ray showed some abnormal condition of the bowel. Many of these children were bolting their food or were permitted to eat between meals. Eleven cases in complete coöperation of the mothers as secured were placed upon a diet eliminating entirely meat, eggs, and milk for a period of ten days. They were given a diet solely of fruits, cereals, green vegetables, toast, bread and butter, and were permitted to drink water freely. After this treatment and a free bowel movement daily the urine of each child without exception showed absence of indican. In conclusion it may be said that indican is present in the urine of the majority of children. A trace is probably normal. Excessive indican is evidence of either intestinal putrefaction or of some mechanical injury of the mucosa or to some suppurative process within the body. Indican is frequently present as the result of constipation. It may have a very important diagnostic value.

DISCUSSION.

DR. B. RAYMOND HOOBLER, Detroit.—It seems to me that there is some fallacy that enters into this work. Where one uses the color test with chloroform as an indication of the amount of indican in the urine it has been my experience that the test is not reliable. We have been using the method of decolorization with potassium chlorate and have found the tests more satisfactory than by simply taking the color of the chloroform as an index.

DR. J. P. SEDGWICK, Minneapolis.—I would like to ask if any one has found as Dr. Fleischner did that the meat intake was an important factor in influencing the amount of indican in the urine in older children. Dr. Porter and Dr. Fleischner have shown that there is a very definite relation between the meat intake and the amount for indican in the urine.

Dr. McClanahan, Omaha.—I have tested a number of these cases by the chemical tests as well as by the colorimetric test.

Dr. B. Raymond Hoobler, Detroit.—I realize that there may be a similar inaccuracy even though one does make the other tests. Relying on the word of the mothers while making the tests would also vitiate them. As to the relation of the meat intake to the amount of indican in the urine, I am very often greatly surprised at the amount of meat that children are allowed to eat.

Dr. McClanahan.—There is no question about the amount of meat taken being a factor in increasing the amount of indican in the urine.

CLINICAL OBSERVATIONS ON POLIOMYELITIS DURING THE 1916 EPIDEMIC; PROPHYLAXIS; DESCRIPTION OF A CHARACTERISTIC SIGN.

Dr. Henry Heiman, New York.—It is almost impossible to improve upon Wickman's excellent classification of poliomyelitis; even this classification, however, does not cover all the types of the disease seen in the last epidemic, the largest ever known. Velum palati paralysis and bilateral ophthalmoplegia, for instance, were rare in previous epidemics, but more rare last summer. The last epidemic has demonstrated conclusively that the poliomyelitis virus may attack any site in the entire cerebrospinal tract. It is interesting to note that in the midst of the epidemic it was comparatively easy to demonstrate certain distinct clinical types of cases, occurring about the same time, in certain localities, and presenting practically the same symptoms and signs. Observation in this respect seems to indicate that there are probably a number of strains of the poliomyelitis organism varying in virulence, and having a predilection for certain regions of the cerebrospinal tract, therefore producing certain specific manifestations. It is usually conceded that Hugge's droplet infection is, in most cases, responsible for the spread of meningitis. There is reason to believe that the virus of poliomyelitis is very likely transmitted by the same means. This does not necessarily mean from patient to patient, but that in many instances the source of communication is a healthy carrier. Therefore, in order to control the spread of poliomyelitis, we must devote our attention to prophylactic measures. These are preeminently the gown, the cap, the hand-brush, and the disinfectants. There are other important measures which have not been sufficiently emphasized. These are, the wearing of a gauze mouth piece and nose mask, or gargling of the throat and spraying of the nose, the last to be employed before and after visiting the patient. It would seem advisable for all persons during an epidemic to pay special attention to the cleansing of the nose and throat.

In reference to diagnosis there are certain points which require emphasis. The most transient paralysis, the slightest paresis of the extremities, the faintest suspicion of rigidity of the neck, inability to flex the head (Draper's sign), the mildest muscle pain or cramps, occurring during an epidemic, should be sufficient evidence to regard the case at least as one of potential poliomyelitis. In connection with this I would call attention to a sign, especially observed in cases of the meningeal type, and which has aided me in a number of instances in making the diagnosis of this disease. This is a distinct tremor of the hands and fingers, a fine tremor of both hands, elicited best by having the hands outstretched and the fingers spread apart. It is present practically always in the early stage of the disease; and may persist as long as eight or ten weeks. To demonstrate this sign more clearly it is advisable for the physician to stretch out his own fingers near those of the patient and compare them, or to intensify the tremor by placing a sheet of paper on the dorsal surface of the outstretched hand. This tremor occurs in other infections but is never so constant or persistent as in poliomyelitis. The disadvantage of this sign is that it cannot be used in young infants who are unable to stretch out their hands or in patients who are comatose.

DISCUSSION.

Dr. Charles Gilmore Kerley, New York.—There are two very discouraging features with reference to poliomyelitis. The one is the difficulty of curing the patients and the other is the ease of transmission, the readiness with which the disease may be carried by the innocent. I have already reported a series of cases in which I investigated the mode of transmission in a rural district in Western Connecticut and Eastern New York during the epidemic last summer. The locality was one which had very little association with the outside world and we could very readily trace the contact. In every instance I found there was some connection with the outside world and with the exception of one instance these people had not had the disease. My investigations point definitely to the innocent carrier as the source of the disease in all of these cases. I wish to emphasize that all who come into contact with the disease should use every precaution to avoid becoming carriers and this includes the use of the mouth gag and protection of the nose.

Dr. Charles Herrman, New York.—There are two points of great interest brought out in this paper. The one is in reference to the various strains of poliomyelitis. I recollect having had a case in which there was paralysis of the palate. Shortly afterward there was another case of the same kind in the same house. When we remember that this particular type of paralysis is rather uncommon it certainly suggests the possibility of different strains having a predilection for certain parts of the cerebrospinal nervous system.

With reference to the question of protection? At the present time I do not think we place so much importance on the clothing as a factor in the transmission of disease, though the cap and gown are useful in keeping the clothing clean. As to washing the hands, that may not be so very important as the physician is usually very careful not to come into contact with the secretions. I do not underestimate the importance of these measures but the most important thing in safeguarding against infection is the proper care of the nose and throat.

Dr. L. E. La Fetra, New York.—In regard to the matter of diagnosis, this tremor sign has been especially emphasized by Dr. Colwell in an article published some time ago in the Journal of the American Medical Association. This sign is valuable when it is present, but often it is not present. The sign which I think cannot be emphasized too forcibly is stiffness of the neck and the Brudinski sign. This is practically always present. However, if paralysis occurs early we may not have this sign.

I agree with what has been said as to the importance of wearing a mouth mask and spraying the nose. I have made it a rule that internes and any others visiting a case of poliomyelitis should wear a gauze mask. The use of a one per cent. methyl albolene seems to be supported by some work of Dr. Flexner's.

Dr. Isaac Abt, Chicago.—From what has been said it would seem that we feel pretty sure as to the mode of dissemination of poliomyelitis. I should like to ask some of the gentlemen and Dr. Heiman in particular, why the disease occurs in the heat of summer, in July and August, and why it disappears in November.

Dr. Hoobler, Detroit.—This may not be quite in line with the discussion, but it has been noted in the New York papers that the statement is made that we are due for an epidemic in the Middle and Far West this summer. Many of our mothers have seen this in the newspapers and have become alarmed. I should like to have the opinion of the members on this subject.

Dr. J. H. M. Knox, Baltimore.—As to the mode of communication, we had an interesting experience in Baltimore. There were twenty-four children about equally divided into two groups. The one group played constantly together and the other group were kept by themselves. All the cases of poliomyelitis that occurred in these children were among those of the first group, while the others in the second group escaped entirely. There were four cases in one family. Examination of the washings from the father's mouth showed that he was harboring the infection. I think this experience shows very clearly the possibility of infection by the ways Dr. Heiman has described.

Dr. Heiman, New York.—It is desirable to use a mild antiseptic solution such as bicarbonate of soda. I carry a little spray in my vest pocket and use a gargle and wash my hands too. I have all who come into contact with the patients do the same.

So far as domestic animals are concerned I do not think they play an important part in the transmission of the disease.

So far as the diagnosis is concerned, in some severe forms of the disease, as for instance the bulbar type, we get the early symptoms of meningitis, but we may not get these symptoms in the milder cases.

It would seem that since we have the disease more frequently in the summer that temperature and barometric pressure have something to do with it. However, the largest epidemic that occurred in Switzerland occurred in the winter time.

Dr. Hoobler has asked whether we may expect another epidemic this summer. It seems to me we may look forward to further outbreaks of the disease where there are children who are still susceptible.

A PATHOGENESIS OF INFANTILE SCURVY—A HYPOTHESIS.

Dr. Henry John Gerstenberger, Cleveland.—1. A hypothesis is offered regarding the pathogenesis of infantile scurvy.

2. The hypothesis is divided into four separate parts, of which only the first is considered to be sufficiently based upon experimental and clinical data to permit its exit out of the domain of pure hypothesis.

The second and third, the latter of which has been similarly and previously advanced by other authors, are considered to have as a basis experimental and clinical data that are distinctly suggestive, while the fourth is still purely hypothetical, although upon its assumption it is possible to explain satisfactorily some of the clinical phenomena of scurvy that hitherto have had not even an hypothetical explanation.

3. A report is made of a case of infantile scurvy which showed a marked reduction in the water output of the body through the kidneys without the presence of the usual and known causes for water loss via other channels, and which further showed a marked change toward a return to normal conditions by the administration of orange juice, indicating a protective salt retention or hindered salt excretion as the cause of the transfer of a good portion of the water excretion from the kidneys to the lungs.

The same condition seemingly was present in two additional cases of infantile scurvy, as well as in scorbutic guinea-pigs on an oat and water diet.

It is suggested that the phenomenon observed is a part of the regular picture of infantile scurvy and represents an addition to the clinical symptomatology of scurvy.

4. A case of infantile scurvy is reported as being a counterpart to Braddon and Cooper's polyneuritic pigeons, but having developed its symptoms on a diet of raw milk, modified, however, by dilution with water to one-half and by the addition of enormous amounts of carbohydrates, in the form of Mellin's Food.

5. The experiences of other authors regarding the inefficiency of cod-liver-oil therapy and calcium therapy in scurvy is corroborated by absolutely negative therapeutic results, having been obtained in a case of infantile scurvy upon the administration of tricalcium phosphate and cod-liver oil, indicating that a deficiency of calcium in the diet or in the body plays no primary rôle in the development of scurvy.

6. A report is made of a distinct but temporary improvement in the clinical picture of two cases of infantile scurvy upon the administration of large doses of sodium citrate. This observation suggests the possibility of the existence in the development of the clinical picture of infantile scurvy of a modus operandi similar to such as

has been shown to exist in cell permeability and irritability by the researches of Jacques Loeb.

CONTRIBUTION TO POLIOMYELITIS.

Dr. Walter Lester Carr, New York.—During the summer of 1916 there were sent to the City Hospital by the Department of Health sixty-three cases with the diagnosis of poliomyelitis. Five of these cases proved later to be rickets, enterocolitis, septic meningitis, staphylococcus meningitis and one was a normal child. Of the fifty-eight remaining cases, seven died, four within eighteen hours, without treatment. Of fifty-four cases treated intraspinously, three died, a mortality of 5.5 per cent. The most frequent symptoms were irritability, hypersensitiveness, loss of appetite and constipation. Hypertrophied tonsils were noted in 25 per cent. of the cases. The superficial lymph nodes were found enlarged in 90 per cent. of the cases. The average leukocyte count was 18,000; the average polymorphonuclear count was 55 per cent. As a general rule the counts rose after treatment. In general there was no typical urinary finding. In this series there were 350 spinal punctures made. With few exceptions the spinal fluids were clear with slightly or markedly increased pressure. The cell counts ranged from 6 to 300, with an average of 36. The different forms of intraspinous treatment employed were bichloride of mercury, diarsenal, adrenalin chloride and freshly prepared immune serum. The results recorded after the use of adrenalin intraspinously include: deeper and less labored respiration, improvement of the quality of the pulse, increased blood pressure, usually ten to fifteen points. The freshly prepared immune serum was used in twenty-seven cases with two deaths; both fatal cases were in coma on admission. Ten to 15 c.c. was given intraspinously after allowing 10 to 30 c.c. of spinal fluid to escape. The injections were repeated two or three times at twenty-four-hour intervals. Adrenalin chloride solution was used in sixteen cases with one death. I believe that while adrenalin chloride is not a specific its value is unquestioned in all severe and toxic cases and those of a fulminating type. In all these cases adrenalin chloride solution 1–1000 can be administered in doses of 1 to 3 c.c. every six to ten hours without danger and with more benefit than any other treatment we have at the present time.

REVIEW.

POLIOMYELITIS. By JOHN RUHRAH, Professor of Pediatrics in the University of Maryland Medical School and the College of Physicians and Surgeons; Visiting Pediatrist to the Mercy Hospital, Robert Garrett Hospital for Children, Nursery and Child's Hospital, Baltimore, and Erwin E. Mayer, M. D. Former Senior Physician at the Mercy Hospital; Instructor of Medicine in the University of Maryland Medical School and College of Physicians and Surgeons, Baltimore. Octavo 297 pages, with 118 engravings and 2 plates. Cloth net $3.25. Lea and Febiger, Publishers.

The literature on poliomyelitis (now over 3000 articles) is so extensive that the need for a volume in which the information is gathered and systematized will be readily appreciated. Theoretic considerations are considered briefly and only those having an authoritative basis are commented upon. Twenty-four terms have appeared in the literature for this one disease, a fact which emphasizes the need of bringing into one volume these scattered records. The authors have been eminently practical in this timely volume and the general practitioner's needs have been especially kept in mind. Even lumbar puncture and the tests useful for diagnostic purposes are detailed. Particularly valuable is the chapter on differential diagnosis. Here Dr. Ruhrah's pediatric experience is manifest in that an appreciation is shown of the difficulties which arise in actual practice. The various forms of medical treatment are given and commented upon in the light of the author's experience. Apparently realizing that most physicians would appreciate a review of the anatomy and physiology of the subject, a chapter is devoted to "Some Anatomical and Physiological Reminders." This might well have been the first chapter of the book. Examination of various muscles and muscle training is not only well described but well illustrated by progressive photographs. Orthopedic treatment is outlined and directions given for the measurement of affected limbs for braces. This book in the library of the practitioner will give him all the phases of the problem and can be recommended as a correct representation of the present state of our knowledge, based upon past and the recent great epidemic in New York.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Types of Penumococci in Infants and Children.—A. G. Mitchell (*Penn. Med. Jour.*, 1917, xx, 343) finds the so-called fixed types of pneumococci of infrequent occurrence in infants and children as compared with adults. Of ninety children, 11.1 per cent. showed Type

I; 11.1 per cent. showed Type II, and 3.3 per cent. showed Type III. The pneumococci without definite agglutination reactions, and classed as Type IV, are of more frequent occurrence in infants and children than in adults; 74.4 per cent. of ninety children showed Type IV pneumococci. The mortality of infants and children infected with the fixed types (I, II, III) seems to be lower than in adults. Of eighty-seven children, none infected with Type I died; 20 per cent. infected with Type II died, and 33.3 per cent. infected with Type III died. Infants and children infected with Type IV have a slightly higher mortality (10.9 per cent.) than adults. The fixed types occur at all ages from six months to eleven years. Type IV pneumococcus often causes as severe an infection as the fixed types. Type I seems to cause a mild infection. Type IV is the most frequent infecting organism in bronchopneumonia, although the fixed types may also be found. Of eleven cases of bronchopneumonia, ten were caused by Type IV pneumococci, and one by a Type I pneumococcus. Complications are more frequent with Type IV infection. Of ninety children, all the severe complications (empyema and meningitis) were in those infected with Type IV pneumococcus.

Fractures of the External Condyle of the Humerus in Childhood, with Rotation of the Condylar Fragment.—J. S. Stone (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 151) says that in children epiphyseal separation of the external condyle of the humerus in which the epiphyseal fragment has become rotated in such a way that the slightly cup-shaped fracture surface faces outward and usually slightly upward and backward, practically always demands prompt open reposition of the fragment. It can easily be felt just beneath the skin unless there is unusual swelling, and can be recognized readily by the clean cut edges and the slightly depressed center. The rounded joint surface lies more or less in contact with the epiphyseal line or fracture surface of the shaft, or with the outer anterior surface of the bone just above the fracture surface. There is a space between the shaft of the humerus and the head of the radius, where the epiphyseal fragment normally belongs, which is filled with blood clot. The periosteum is often torn off from the outer side of the shaft for a little distance upward, but may remain attached to the outer border of the rotated epiphyseal fragment. Under these conditions the torn-off periosteum may be more or less stretched across the fracture surface of the fragment. In most instances it is impossible by manipulation to rotate the fragment back into place so that the fracture surfaces lie in contact. The treatment demanded early after one of these fractures has occurred, is open incision, exposure of the fragment, removal of the clot and any fibrous tissue which may occupy the space from which the fragment came, and then with a blunt dissector the prying of the fragment into place in its normal position. The open reduction should be done within the first few hours or else after a sufficient interval for the swelling and ecchymosis to have subsided. No suture of any sort need be put in the bone. Usually it is impossible to stitch the periosteum. There is no tendency to displacement once the fragment is replaced. Acute flexion locks the fragment in place. Stitches in the fascia and skin hold everything securely. Acute flexion may be maintained for a fortnight. The arm may then be put in an internal angular splint and later in a sling. If two months or more have elapsed since the injury, the treatment must be determined by the conditions in each case, but as a rule, the excision of the enlarged and useless fragment will give better results than any plastic bone repair.

Pyelitis in Children.—W. C. Quinby (*Jour. A. M. A.*, 1917, lxviii, 591) believes that pyelitis in children is more often a serious or even fatal malady than has been thought in the past. Though female children are attacked more often than male, this difference is not so great as was held by the earlier writers. The origin of the disease seems quite surely to be from the intestinal tract in a good many cases, but the theory of infection ascending from the lower urinary tract cannot yet be entirely disproved. Medical treatment has been too haphazard heretofore. It should be based on the accurate knowledge gained by estimation of the properties of the specific infecting organism. This can be obtained by determining the hydrogen ion concentration of cultures both of the organism and of the urine. Pediatricians and internists have not yet appreciated the value and possibilities of pelvic injections. Wherever possible this should be urged in those cases in which the urinary tract does not become entirely free from infection within a reasonable time.

Relation of Bacteriuria and Pyuria to Intestinal Disturbances in Children.—F. C. Neff (*Med. and Surg.*, 1917, i, 536) says that various intestinal disturbances are found as the cause of bacteriuria and pyuria in children, constipation, ileocolitis, dyspeptic diarrheal conditions, occasionally appendicitis, rarely tuberculous, disease of the peritoneum and bowel, bacillus coli usually, and other organisms occasionally, are carried from the intestine through the blood-stream or lymphatics to the kidney pelvis, by which the urine becomes infected. It is difficult in the absence of a pathological examination of the urinary tract to state how much involvement of the renal tissues there is, but from the fact that urines so often clear up under short medication, it is probable that many cases do not go farther than a bacteriuria and pyuria in which there is simply a catarrhal inflammation of the kidney pelvis. In some cases there may be ureteritis and rarely a cystitis. One cannot tell from the urine alone just how much of the urinary tract is involved. The term pyelitis, as usually employed, is incorrect in that many cases show only the presence of pus and organisms in the urine, secondary to a focus in the intestinal tract. Examination of the urine after acute digestive disturbances in a child whose general condition does not clear up, is as necessary as the examination of a chest during the course of pneumonia. In the treatment of urinary infections one should bear in mind their frequent intestinal origin and the possibility of a recurrence. Hence the usefulness of keeping the bowels open and the avoidance of further digestive disturbances.

Does the Spinal Fluid from Human Poliomyelitis Contain the Specific Infective Agent?—The fluids from forty patients with poliomyelitis were centrifuged at high speed for three quarters of an hour by H. L. Abramson (*Jour. A. M. A.*, 1917, lxviii, 546). These fluids were derived from cases early in the disease, most of them in the preparalytic stage. The sediments, amounting to 1 c.c. of very turbid fluid, were injected intracerebrally into a Rhesus monkey. Culture tubes of glucose ascitic agar inoculated with some of the sediment remained sterile. No effects were noted, and after an observation period of two months, this animal was inoculated with suspension of a known monkey virus. After an incubation period of eleven days, paralysis appeared in the left leg, then the right. It would appear from this experiment that there is present little, if any, virus demonstrable either by culture or animal inoculation in the fluids of human poliomyelitis in the early stages.

Colloidal Gold Reaction of Cerebrospinal Fluid in Acute Poliomyelitis.—L. D. Felton and K. F. Maxcy (*Jour. A. M. A.*, 1917, lxviii, 752) have tested 57 fluids from patients with poliomyelitis. They find that in the acute stage of poliomyelitis, the spinal fluid reacts with colloidal gold in dilutions of from 1:40 to 1:160, producing a maximal decoloration of 3 ("blue"). In the second and third weeks the reaction is practically the same as in the acute stage, with a tendency to clear up in some cases and a precipitation in the higher dilutions in others. There is no constant rule. In the fourth to the eighth week the colloidal gold reaction runs practically to the globulin-albumin content, persisting in some cases to the eighth week and beyond, but still occurring in dilutions of from 1:40 to 1:160. As the spinal fluid in acute poliomyelitis reacts constantly in the same zone, the gold chlorid reaction is helpful in the diagnosis of this disease. They deem it advisable to use the following nomenclature in reading the reactions of Lange's colloidal gold test: (*a*) Zone 1 (or paretic zone), maximum precipitation from 1:10 to 1:160, with complete decolorization. (*b*) Zone 2, maximum precipitation from 1:40 to 1:160, with decolorization up to 4 (light blue). (*c*) Zone 3, maximum precipitation beyond 1:160.

Cerebrospinal Fluid in Poliomyelitis.—The colloidal gold reaction with cerebrospinal fluid from patients with poliomyelitis has been recorded in isolated instances. The results in these few cases indicated that this reaction might be of service in the diagnosis of this disease. In order to investigate this point, cerebrospinal fluids from patients in 100 cases occurring in the recent New York epidemic were examined. From their results P. C. Jeans and M. R. Johnston (*Amer. Jour. Dis. Child.*, 1917, xiii, 239) conclude that the colloidal gold reaction is of distinct service in the diagnosis of poliomyelitis. The greatest usefulness of the reaction is in showing to be pathologic a fluid which does not give other evidence of abnormality when examined as to its albumin, globulin and cellular content. This evidence of abnormality is most useful in those cases of poliomyelitis in which there are the usual symptoms of onset and in which paralysis has not developed. The writers believe that the Lange reaction is of service in differentiating between poliomyelitis and tuberculous meningitis, between which diseases there not infrequently arises for a time a confusion as to diagnosis.

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ORIGINAL COMMUNICATIONS.

PRESIDENT'S ADDRESS, THIRTIETH ANNUAL MEETING AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

BY
JOHN W. KEEFE, M. D., LL.D., F. A. C. S.,
Providence, R. I.

To be accorded the opportunity of presenting a Presidential Address before this National Association, whose roll of membership comprises so many distinguished men, is an honor of which I am more deeply conscious than I can well express; and yet, though my words be inadequate, I assure you that my feelings of responsibility and of gratitude are profound. That you have deemed me worthy is my encouragement.

The Founders of this Association builded far better than they knew, for they began a work, which, as our transactions testify, constitutes a monument of stupendous thought and effort, to which we may point with very pardonable pride.

Though still relatively young in years, we are yet rich in accomplishment. The cosmopolitan and democratic character of our Society creates an atmosphere, which encourages the seeker after truth, in our chosen field of labor, and gives him that mental stimulus which leads to fruitful endeavor.

Year by year, we constitute a forum, where original ideas are brought for discussion, new operations described and even visualized on the screen, and the conclusions derived from personal experiences offered for friendly criticism. Each Fellow is conscious that he is speaking to an audience, whose sympathies are awake to anything worth while, which he may have to offer.

While in his local field of activity, a man may hesitate to express his views freely because of social or political reasons, or through fear of hostile or unjust criticism; here, he may set forth his opinions without fear or favor. From the East and the West, the North and the South, men bring to us the ripe fruits of their labors, knowing full well that our appreciation will ever be equal to their merits, and when their various and often-times antagonistic views are debated in friendly rivalry, they feel that here indeed is a means for obviating any possible tendency toward provincialism; and hence we become a liberalizing influence in medicine. This you will agree is no small accomplishment for any society.

By means of our yearly meetings the older Fellows are heartened to continue their efforts with greater energy; while the younger are inspired to emulate and even if possible, to surpass the notable men who have been and are Fellows of this dignified body, as well as leaders of the medical thought of their time; and so, with whatever misgivings one may have come, one cannot but return filled with the laudable ambition of applying the knowledge here inbibed, thereby making for greater efficiency.

While we are prodigal of appreciation for sound ideas, woe to the individual who presents theories which do not ring true; for he is certain to learn that his mental children are doomed to speedy annihilation, and yet, criticism, though caustic, is ever of the theory presented, never of the man. It is but human, that every one should have his periods of gloom and depression, and that he should require as a stimulus, the approbation of his confrères for work well done. Be not then sparing of your praise, since it often spurs the recipient to greater efforts.

> "Who strives with earnest will has half attained
> For in the striving, richer life is gained."

From a somewhat varied experience, I think I may truly say that there is no society where a more kindly spirit prevails than in this, or where a more lively interest is taken in the scientific part of the program. The array of papers to be presented at this, our thirtieth meeting, bids fair to equal the high standard set at former gatherings. Our splendid program is largely due to the tireless and indispensable efforts of our valued Secretary, Dr. E. Gustav Zinke, to whom, I am sure, we all pay the tribute of love and gratitude.

The training of the doctor renders him unlike men engaged in secular affairs; oftentimes, he is a dreamer, an idealist and an altruist, as well as a disciple of the healing art. He has the spiritual side of his nature developed, not unlike that of the poet, the painter, the musician and the sculptor. We, too, have heard at times, the remark, made in a disparaging manner, that a certain surgeon possessed merely manual dexterity, little heed being given to the thought that his facility in the use of his hands must have been due to brain dexterity. As Sir Clifford Allbutt so well says. "We have always been prone, and not in universities only or chiefly, to forget, that the temple of education cannot be built without hands. These subtle ministers are directed by the mind; but by the mind which they themselves have created, as in the State, we are directed by the government we ourselves have established. So long as nerve and muscle are growing, the hand—and by the hand I now signify every instrumental limb of the body—seems to achieve a little more than the mental suggestion; it explores, and often in each new use or adventure, discovers a little wider range of function than the will had dictated; of these gains of experience, time after time, conceptions are returned to the brain, and there registered in multiplications of structure; and thus gradually, from the beginning, by each successive function of such limbs, by practice, as we say, both ability and capacity are tentatively developed, and things outward to draw the inward quality after them. Thus the periphery, or growing edge of the whole sphere of bodily function is the mind's workshop."

Now, it would not be difficult to show, from the history of medicine, that the education of the mind has always accompanied the education of the hand; the hand being, to adapt a phrase of Burdon Sanderson's, "The scientific instrument of the surgeon." So true is this, that when the mind languishes, the cleverness of the hand is proportionately diminished, and when the hand fails in its ministrations, the mind ceases to grow; and so it is that the surgeon, if he would be a skilful craftsman, must of necessity be first a skilful thoughtsman. For in what consists the surgeon's manual dexterity, if it be not in the deft application to the diseased human body, of the principles of anatomy, physiology and pathology; converting his concepts into acts, he thus becomes, as it were, the mediator between the theories of the schools and the lives of his patients.

Let us, therefore, banish from our minds, if indeed we ever entertained it, the superficial and quite erroneous view that mechanical facility alone is the chief attribute of a successful surgeon.

How far, think you, would mere manual dexterity have carried a

Murphy, a McBurney, a Bigelow or a Senn, did they not possess also the wide sweep of intellectual vision, which opened to them hitherto unexplored fields for research and gave them that mental alertness, which was the prerequisite of their notable achievements.

I have often marveled at the power of imagination and of sustained thought in the men who have devised our unique operative procedures. I do not now refer to those operations, the simplicity of which is obvious, but rather to those other subtle and complicated maneuvers, which tax to the utmost the ingenuity of the surgeon, and which correct the defects or perversions of nature by the assistance of art.

Hence I observe that the cunning of the hand is but the outward and visible sign of the power of the brain that directs it; and therefore it is, that nothing in medical science is alien to the surgeon; nothing comes to him amiss, if by it his mental horizon be widened. There is no place in modern surgery for that type of narrow specialism which cramps the mind's development; while the customary and unfortunate separation of medicine from surgery is as false in theory as it is vicious in practice.

As with the hand, so also with the eye; mind and eye work together and constantly act and react upon each other. He who looks at things with the eye of intellect sees them with a new precision and accuracy. He is driven by the intellect itself, so to see them. Intent on probing into the nature of things, on divining their purpose and composition, and whence they came and whither they are going, and a thousand other facts about them, the intellect must needs in all these matters employ the eye to collect data for it; this in turn results in a new discernment and discriminative power, imparted to the sense of sight. So that the desire of the mind to distinguish accurately and define exactly, grows by degrees into unconscious properties of vision; and seeing with the mind, as it may be called, becomes seeing in a new and more positive sense of the word. The power of rapid and intuitive vision found in great surgeons is, or so at least it seems to me, the power of seeing with the mind, as distinguished from the mere seeing with the eye.

These three then, hand, eye, mind, working in mutual helpfulness, constitute the ideal surgeon as I am trying briefly to picture him to you. And if to be a surgeon is to possess these things in their highest development, who will deny that our constant need is to strive for their greater perfection?

I said that the cunning of the hand is but the outward and visible sign of the power of the brain which directs it, and that the surgeon who would be a good craftsman must first be a good thoughtsman. Let us now dwell briefly upon some of the implications of this idea.

No one, I suppose, will deny that there is a thread of continuity binding together into an organic whole all the various departments of medicine. Each department severally, does but give us a certain aspect—some partial view of the truth, and all of them taken together are essential, if we would attain to a philosophic grasp of things. Now, it is expected of us that, as surgeons, we should be specialists, but let us beware that we do not at the same time become exclusivists. A specialist is a man who confines his practice to one thing; an exclusivist is a man who confines his knowledge to one thing. Specialism, by the very fact of its being such, is too apt to close the windows of the mind and to rob it of its flexibility. How painfully conscious we are at times, that our judgment is at fault, because we have forgotten, if indeed we ever knew, the complete data necessary to it. It is a truism to say that surgery demands an intimate knowledge of anatomy, but is it not equally true, that surgery demands a similar knowledge of physics and chemistry, of physiology and even of psychology? Structure and function go always together; structure being the framework of function, and function the structure at work. When we seek to understand function, do we not speak the language of chemistry, physiology and psychology?

The limitations of our human faculties and abilities compel us to a division of labor; and here lies the pitfall that besets our progress. Our constancy to one thing too frequently spells neglect of the rest; and the very intensity of our vision narrows the sweep of it.

Surgery, after all, is a method of treatment, and if such it be, the surgeon's knowledge, ideally at any rate, should be extended to every condition requiring treatment.

This, I am well aware, is impossible of attainment by any individual man, however great his intellectual endowments may be; hence the practical necessity for coöperation between workers in different fields. The surgeon needs the chemist, the bacteriologist, and the internist, quite as much as they need him. The time is past when one man can play so many parts. As in commerce, combinations are the order of the day, so in medicine, more team work is the desideratum of the present.

The conservation of human life, the relief of pain, the prevention and amelioration of disease, is not this a glorious heritage that we of the medical profession possess? "One man practised in medicine verily outweigheth many other men." This compliment greets the medical profession at the rise of Greek medicine, and posterity has never recalled it. Throughout the ages men practised in medicine have outweighed other men; and why? Because from the time when they first dressed the wounds of Homeric heroes until the present day, they have been in human society a conservative and constructive force. While others have pulled down, they have builded up; in the midst of strife, they have pursued the arts of peace; and even to hate they have shown the countenance of love. It was, indeed, by no mere rhetorical flourish, that Robert Louis Stevenson called the physician, "The flower of our civilization: because he has shared as little as any, in the defects of the period, and has most notably exhibited the virtues of the race."

Not in medicine only, but in life generally, tradition and sentiment are beacon lights which guide us on the ocean of life. Who ever tires of listening to the tales of hardy seafaring men? How manly the tradition that a sailor should never hesitate to risk his own life to succor a seafarer in distress, and how touching the sentiment there enshrined! How these glowing accounts of brave deeds of self-sacrifice thrill and inspire us. Yet, to-day, these long cherished ideals seem to have been forgotten, and the S. O. S. call too often remains unanswered. How long before men will again have instilled into their minds, that "Greater love hath no man, than to lay down his life for his friend?"

In this tragic world war, when man's inhumanity to man makes countless thousands mourn, when human life is held at naught, and human brains are racked to devise new instruments of destruction, each more deadly and revolting than the other, is it not comforting, nay inspiring to feel, that there is in the world a thoughtful and earnest body of men, who, like the men of the sea, imbued with high ideals, are ministering to the wants of friend and foe alike; who fear nothing so much as failure in service, and who constantly endure great personal sacrifices to increase their knowledge of science, to the end that its beneficent ministrations to the sick and wounded may return them again to health and happiness.

I am thinking of Walter Reed in Cuba, of Ronald Ross in Africa, of Laennec in Paris, of Jenner in Gloucestershire, and of that goodly host of other truly great but modest heroes, whose lives were as replete with good works as they were scanty of general recognition or reward.

I am thinking too, of those hundreds of brave men, members of our guild, who in the last three years, have gone to their deaths amid a shower of bullets, while they were easing the pain or comforting the last moments of some stricken soldier.

They have no place in storied page,
No rest in marble shrine.
They are past and gone with a vanished age,
They died and made no sign.
But work that shall find its wages yet
And deeds that their God did not forget,
Done for His sake divine.
These were the mourners and these shall be
The crowns of their immortality.

Here is a theme worthy of our sober reflection, worthy too, I may add, of the pen of poet or the painter's brush.

For after all, the most important thing about a man is his standard of values. What he lives by and what, if need be, he is ready to die for: and was it not perhaps, because they recognized his high moral standards, his genius for self-sacrifice and renunciation, that the Greeks and all other peoples, have held the physician in such universal esteem?

In the search for wealth and power, men are forever forgetting the enduring dignity and worth of human life, and it would seem that by some benevolent dispensation of Providence, physicians have been raised up even on the battlefield to remind them of it.

What statesman or warrior or merchant prince has conferred upon humanity, gifts that are indispensable? But who can say that mankind can spare the gifts of Semmelweis, of Lister or of Pasteur? War of man against man we can well dispense with; but war of man against disease we shall always welcome as an alleviation of our manifold human sufferings.

When the present lust for blood has passed, leaving the rancor of hatred in the hearts of many, what an inestimable amount of good the medical profession, with its lofty aspirations may accomplish, by teaching mankind once more, the value of human life.

Other lessons may also well be learned. We were wont to believe that liberty was license, and forgot the fact that obedience to law is liberty. We sought privileges without realizing that whenever we are granted a privilege, there is also a duty imposed upon us. This is a day of sacrifice for each and every one of us, and it is sacrifice alone that calls forth the highest qualities that man possesses. We were rushing along in a mad race for material things, with the consequent lavish and frivolous expenditure of money, seeking happiness in luxurious living; but we are now being chastened, and I am certain we will emerge from the fire sobered and freed from the worship of many false gods.

And so I close by saying that the physician has ever stood forth as a benefactor of the race, not chiefly, or solely in a material way, but rather in a spiritual sense. His has been and is, the high privilege of conserving life rather than of destroying it. May we too be worthy of our precious heritage, striving always—

"To set the cause above renown,
To love the game beyond the prize,
And dearer yet the brotherhood
That binds the brave of all the earth."

FUNDAL HYSTERECTOMY TO REDUCE THE MENSTRUATING SURFACE.*

BY

GORDON K. DICKINSON, M. D., F. A. C. S.,
Jersey City, N. J.

PHYSICIANS of a generation or so ago, not having developed specialties, studied the body entire. It is true that some sat on stools and applied silver nitrate to the cervix and called themselves "gynecologists," but the brains of many talked eloquently of each tissue and organ and also of the social or business life. They viewed each department from a high plane, but in treatment selected one organ in clinical research.

For conscientious diagnosis each woman must be studied not only as to the function of each organ of the body, whether pelvic or other, but as to her psychy, maternal instincts, social life and occupation, for the woman must be known as well as the womb.

Sex is a matter of broad significance. Narrowly we look upon it as a condition of the generative organs. By biologists these are considered simply as primary sexual characteristics, but the secondary sexual characteristics are even as important as an indication of sex life, such as temperament, sex instincts, maternal love, form of the larynx, swelling of the thyroid gland, position of hair on the abdomen, and the soprano voice, for sex penetrates the whole person.

In every-day observation it cannot but be noticed that sex development varies in each female. Not infrequently do we find some of the evidences of contra-sexuality. Many girls early develop a down on the upper lip. We often see women with moustaches and imperfect whiskers, and many women have hair around the nipples and on the abdomen coming up to the navel. As a morbid tendency we find the soubrette voice, common in our concert halls, which is said to be an imitative masculine type.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

Emigrants from the lower countries of Europe, where the call of the germ plasm is less disturbed by conventions, seldom show any evidences of retrograde or masculine tendencies. When married, if asked if they have any children, their reply is always, "Sure!" But in this country, at least, whether due to the climate or the type of social life, there seems to be a tendency to degenerate. The true sexual characteristics (physiological and psychological) are often not uniformly developed, and we have coming to our clinics not always the true woman with perfect correlation of internal secretions and nerve tone, but women with evidences of a starvation of tissues because of defective internal secretions from the sex glands.

The normal ovary is full and plump. It contains two sets of tissues which activate the different generative and other organs of the body; the corpus luteum has its effect upon the uterus, but there is an epithelioid tissue disseminated through the ovary emitting a substance which is potential for all that which goes to make up femininity. Its action is inversely with that of the hypophysis. As its function is interfered with, diminished, or congenitally absent, so does the hypophysis enlarge, and allow of a development more nearly on the masculine scale, or, if not exactly that, a perversion which is weakly feminine.

The sympathetic system which is more largely developed in the female than in the male is another relic of antecedent biological life. The disturbance of its innervation often leads to mysterious uncontrollable reflexes, which vary according to the paths of resistance in different parts of the body.

There seem to be three portions of the body very closely linked, not only as to the function of their tissue, but the subconscious life of the individual: the brain, thyroid gland, and sex glands. Anything which interferes with the systematic working and conventional action of these organs interferes with personality, sense of comfort, intellect, and one's subconscious life.

The gynecologist of to-day cannot sit on a stool, operate and philosophize on the pelvis. He must be a neurologist. He must be in close touch with sociological affairs. He must look upon the woman as a being in which every cell is feminine and needs during the greater part of her life the tonic effect of her potential internal secretions.

Surgeons have been growing more and more conservative. Less surgery is being done which mutilates, Nature's ability to repair and to restore being recognized and employed. Nevertheless, the surgeon is no exception to the rule that where there is power it is prone to be used. Too often do we remove the uterus instead of merely the tumor, a tube capable of restoring itself, and interfere with the circulation of the ovaries by careless surgery!

Sometimes after confinements, either from debility of the general system or exhaustion of nerve fibers, the uterus fails to contract in the five or six days allotted to the principal part of involution. Infections arise, which are more or less severe. In the milder cases there is a cessation of the involution process and the development of a large fibro-fatty organ, which through weight and congestion leads to a train of symptoms known as the "uterine syndrome." An infection somewhat more severe sets up an interstitial inflammation resulting in fibrosis of the uterus, an organ not over large, but hard with a condensation of fibrous tissue around the blood-vessels. Then, again, there are cases where the entire substance of the uterus is replaced by a mass of whirls, each whirl resembling the annular rings of sections of a tree.

Of these several processes the large fibro-fatty uterus encourages the hyperemias with hyperplasia of the endometrium. The fibrotic uterus, or the one with arterial fibrosis, is associated with an atrophic condition of the endometrium. In the former case the woman may become pregnant but tends to abort. In the latter, she is sterilized. In both cases we have menorrhagia, prolonged periods, excessive bleedings, and an evacuation of clots, and, particularly in the cirrhotic type of uterus, there is often a continued leakage.

In the beginning Nature will make blood as rapidly as she wastes it, but the time comes when the blood-forming organs become exhausted, then the balance turns over and anemia, low blood pressure and increasing debility supervene, and according to the mental disposition and therapeutic habits of her physician will the patient be treated. There are those who to-day will give iron; those who have faith in hydrastis; those who will try stypticin. In the meantime, blood is wasted and time passes, and when the case comes into the hospital for the surgeon's care the plight is often extreme.

There are four methods of surgical treatment in vogue and their selection depends upon how the surgeon's mind has been trained and largely upon the same faith in surgical therapy that we see so sadly expressed in the medical. The first thought of many is curettage, but any surgeon who has carefully curetted the interior of the uterus before removing it, then on the palm of the hand has split it open and studied the interior cannot but realize the inefficacy of the curettage—how the surface is lacerated, the mucosa incompletely removed, rendered liable to sloughing processes, and how very rarely he is able to make a clean job of the fornices and fundus. As a diagnostic procedure, McMurtry is correct in claiming that it not infrequently fails.

A study of the profession leads one to the opinion that the operator curets often and the surgeon seldom, and that one obtains a knowedge of the surgeon's standing by the infrequency of his curetments. In this trouble, at least, hemorrhage is not controlled, except for a time.

Boldt's method of the introduction of a solution of chloride of zinc has established a value in his hands, but, being an office procedure and one that can be done in the home, its use may be taken up by the tyro, and from our experience with strong solutions of zinc there is a possibility of too great a sloughing of the interior, uterine infections, and perhaps worse. There is no objection to its employment by the most competent, but it should not be used by any other.

Those who have radium and employed it have met with success, but the expense and the difficulty of purchasing it make its use very limited.

In June, 1915, after having performed for persistent hemorrhage a long series of horizontal amputations of the uterus somewhat above the internal os, it occurred to the writer that less surgery might be done through another type of operation with a smaller liability of interfering with the circulation of the ovaries. Gradually the idea came that by a fundal hysterectomy, excising a wedge-shaped piece of the womb, removing half or more of the endometrium and reducing the menstrual surface in part, the woman would not be immediately or later unsexed, not deprived of her monthly period, and neither the body nor the mind feel the shock of mutilative surgery. So, step by step, the operation to be described was evolved.

However, as soon as it became evident that something a little unusual had been developed, the literature was searched. It was found that in 1913 Buettner, of Switzerland, described a somewhat similar procedure but for pus tubes. He did a hysterectomy, then resected not only a wedge-shaped portion of the uterus, but the tubes in addition, leaving the ovaries, then bringing his flaps together. Crossen in his "Operative Surgery," 1915, speaks of a wedge-shaped resection of the fundus for fibroids and fibromyoma, reducing the menstrual surface, but his limit was that of the growing tumor, and not a physiological limit.

The plan that has been selected here is always *per vaginam.* After placing a purse-string around the anus, so that during the operation there may be no puffing out of fecal matter from that vent, a clip is applied to each labium, which is retracted. Into the vagina is poured an ounce or more of 3.5 per cent. tincture of iodine, this is allowed to remain while the patient is being draped. When everything is ready, a volsellum is put on the cervix and it is brought down. A transverse incision is made anterior to the cervix, the bladder separated from the uterus, the peritoneal cavity opened, and the fundus very easily brought into the vagina. We now have an inspection of it and the adnexa. Clips are firmly but gently applied alongside the uterus to slightly compress the circulation and act as retractors. A "V" shaped incision is then made through the substance of the womb for a varying depths, depending upon the extent of the disease as estimated by the clinical sign of hemorrhage. This is not made too close to the fornix because the object is not so much the reduction of the uterus as the reduction of the menstrual surface. After this wedge-shaped piece is removed, both fornices should be thoroughly cauterized. If not, they will respond at the menstrual period, and producing tension, give rise to pain. The cervical portion should also be touched for aseptic reasons. Of course, the part removed is carefully inspected for any appearance of malignancy. With a small, sturdy, curved needle, the two flaps are approximated, staunching hemorrhage. The peritoneal surface is further brought together by running catgut, clips are removed, uterus pushed back into place, and the anterior colpotomy wound sutured.

We feel it very essential for the reasons mentioned in the preliminary discussion that so long as it was meant that a woman should flow, a menstrual flux should be allowed to her. Then, again, there are many females who are subject to high tension and nephritic conditions, and the sudden stopping of the safety-valve of uterine discharge will accentuate the high tension and lead to disaster.

If the time ever comes when our operating rooms are dominated by female surgeons, I am sure that the average man operated upon by them who had his testicle circulation interfered with or his vesicula seminales removed would feel justified for anger and retribution. Likewise, we men who operate upon women should have the same consideration for their sentimental side. We should safeguard their structures. We should make every endeavor to reduce our surgery to a minimum, and above all, endeavor to avoid that which mutilates or takes from the woman what is her natural endowment and keeps her from being like other women.

PHYSICAL CONDITIONS IN WOMEN WARRANTING STERILIZATION.*

BY

ELLIS W. HEDGES, M. D.,

Plainfield, N. J.

THE sterilization of women is something which, like marriage, should not be entered upon "unadvisedly or lightly, but reverently, discreetly, advisably, solemnly and in the fear of God."

Rob a woman of her power to bear children and you take from her the chief crown of wifehood and, at the same time, you deprive the state of potential citizens and supporters.

In doing this operation you may pander to the selfish desires of some women to escape all the responsibilities and cares of motherhood, and, on the other hand, you may save useful lives which would be sacrificed in vain in the pangs of childbirth, and you may conserve mothers for the care and bringing up of the little ones they already have, by preventing future pregnancies that would be almost surely fatal.

The profession may always be trusted to stand loyally against this operation done for any unworthy purpose, but we believe there are times when it is our duty to do it to save valuable lives, even at the risk of subjecting ourselves to ignorant and unjust criticism. Sometimes it may be necessary to interrupt a pregnancy and to sterilize at the same time; again, after a perilous labor has been safely past, it may be required of us to prevent future conceptions. Very briefly we will discuss some of the conditions which, in our judgment, demand the operation of sterilization in women.

ECLAMPSIA IN TWO SUCCESSIVE LABORS.

If a mother has had eclampsia in two successive confinements she should have her tubes resected so that no further risk of impregnation can occur. I have done this once in my practice in a patient who showed no sign of nephritis between the first and second pregnancies. Each time she nearly lost her life though she is perfectly well now fifteen years after the operation. We are still in doubt as to the cause of eclampsia, though it seems to be due to a toxemia of pregnancy, and we know it is not always due to a nephritis. We know that it is only one-third as frequent in primiparæ as in multiparæ, though the claim that one attack gives immunity against subsequent seizures is not borne out by the facts. We know, too, how fatal it is to both mother and child, causing a mortality of 20 per cent. in the former and 50 per cent. in the latter. What right have we, if our patient has had two successive attacks, to risk the life of both parent and child in another pregnancy when we know we can save the mother by a simple operation?

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

DIABETES.

Another condition warranting the operation is diabetes. Not the transient glycosuria of pregnancy, but a real diabetic condition with grape sugar, acetone and diacetic acid in the urine, polyuria, thirst, sugar in the blood, and a general wasting of the tissues. If this condition is discovered in a nonpregnant married woman, unless the disease yields readily to treatment, or unless absolute sexual separation from the husband can be secured, I believe she should be sterilized. If the disease is discovered early in pregnancy, then we should do the combined operation of sterilization and abdominal hysterotomy, as recommended and practised by Dr. Palmer Findley.

There are a number of considerations which lead us to this conclusion. Labor has a bad effect upon the disease, worse even than surgical operations, and at least 30 per cent. of mothers die of coma before or during delivery, while 20 per cent. more die soon afterward of this disease or of tuberculosis. Nature often tries to save the mother by bringing about sterility in these cases by atrophy of ovaries and uterus; and in those who become pregnant, two-thirds of the babies are lost either by abortion, premature labor or early death. We can understand these facts if we remember that the liver is already overburdened in pregnancy, and that in diabetes the carbohydrate metabolism of the liver is at fault. If a woman has had diabetes and recovered, or perhaps has the disease in a latent form, pregnancy is almost sure to develop it.

Duncan and Schede state that if once a case has come through the ordeal, no further child-bearing should be allowed, and in this verdict I believe we all agree.

CHRONIC NEPHRITIS.

Chronic nephritis, either of the parenchymatous or interstitial type, is another condition warranting sterilization. De Lee says that women with chronic nephritis should not marry and, if married, should not conceive. It is hard enough, both on the patient and physician, to deal with the ordinary nephritis of pregnancy or with an attack of acute nephritis, but pregnancy has such an alarming and disastrous effect upon the chronic type that we should leave nothing undone to prevent a complicating conception.

We recognize the parenchymatous type by the hyaline and granular casts, white and red blood cells, diminished urea and small amount of urine, and the interstitial type by polyuria, low specific gravity, small amount of albumin, few hyaline casts and high blood pressure.

The outcome of such cases is that 30 per cent. of the mothers die and 70 per cent. of the children are lost.

If the mother survives, her nephritis is invariably worse than before and more securely fastened upon the system, entailing invalidism and a shortened life.

As opposed to that picture, sterilization saves her for years for what may be, at least, a comfortable existence, and if we find out our patient's condition only after pregnancy has begun, then we should end it by hysterotomy and resection of the tubes. This can be done under gas-oxygen anesthesia without danger and without aggravating the nephritis, and it seems to us the argument is overwhelmingly in favor of interference.

PULMONARY TUBERCULOSIS.

If a mother has active pulmonary tuberculosis, we should sterilize. If latent, this disease is lighted up by a pregnancy and may be brought to a probably fatal ending shortly after confinement. We know how long and how comfortably a tuberculous patient may live under modern treatment, and if we find in such a one a uterus with an embryo in it in the early months of pregnancy, why should we doom the mother to certain death a few months hence by letting her alone when we can, in all probability, save her life for years to come by prompt interference?

Here, too, we should empty the uterus and tie the tubes. Some may say this woman may recover entirely in time, and when you have sterilized her she can no longer bear children. Our answer is, that even if cured, the disease is latent and likely to be excited by another pregnancy, but even if we grant the contention, by the method of implanting the ends of the tubes in a slit in the broad ligaments they can later be taken out, opened and anastomosed, and the sterility is undone.

Of course tuberculous persons should not marry and, of course, they should not conceive, but until the strong arm of the law steps in such things will happen, and it is our privilege to, at least, mitigate the miseries entailed by such criminal folly. Our experience does not coincide with those who hold that tuberculous women seldom conceive, and we believe that while working for the enactment of proper laws on the subject, we should meantime do our best to save these unfortunate people. Very often, of course, tuberculosis develops only after marriage, and then no law would avail.

CARDIAC DECOMPENSATION.

Many cases of heart disease go through successful labors, though the effect of pregnancy and parturition by throwing an extra strain on the organ is to increase existing trouble. But when there is decompensation due either to myocarditis or to valvular disease, and it matters not whether this latter is mitral, aortic or the two combined, then child-bearing is a more hazardous undertaking.

Statistics place the maternal mortality anywhere from 6 to 85 per cent., but all writers agree to the grave dangers confronting the mother. Abortion, premature labor and stillbirth claim the vast majority of the fetuses.

If we are brought face to face with a case which presents edema, ascites, dyspnea, attacks of suffocation, palpitation, cough, insomnia, what are we to do? We believe the answer is plain, and that is, to empty the uterus through an abdominal incision and sterilize if we see the case early, and if the child is near viability tide the mother along with rest and heart tonics till the child can be taken, and then, if the mother survives see that the tubes are resected before another pregnancy can occur.

Pregnancies, such as these, which are so apt to result in the death of the fetus, and in the death or impairment of the mother, are not worth while and should not be allowed to occur.

As physicians, we cannot enforce this treatment, we can only advise, but unless we state to the patients the probabilities in all candor, we are not doing our full duty.

Pregnancy, complicated by any of these diseases which we have mentioned, is a perilous thing for both mother and child. The chances are more than even that one or the other will perish and very often both lives are lost.

Moreover, the children of eclamptics, of diabetics, of chronic nephritics, of the tuberculous and of decompensated heart cases, even if born alive, often enter life with such a physical handicap that no well-wisher of the race could welcome them. If we see a married woman suffering from any of these conditions before conception, a plain talk with both husband and wife, backed by a consultation which should always be held, would often persuade the couple to permit this harmless and effective procedure, and thus many useful lives would be saved. If seen in early or mid-pregnancy, a hysterotomy and sterilization would still hold out hope for the mother. If seen shortly before viability, an attempt should be made to tide the mother over the few intervening days, but as soon as viability is assured, bring on labor at once and sterilize later.

There are other conditions, too, for which sterilization should be done but here we will find opinions more divided.

PYOSALPINX.

The much mooted question whether or not to sterilize in these cases is still about the same as it was when we were students of medicine. If the woman is well to do, and can afford to be an invalid, let her alone with a nurse and a fountain syringe and an easy chair. Sometimes the tubes reopen and a pregnancy may occur. But if she has to earn her living, take out her tubes and give her health and sterility, after a fair trial of palliative measures.

INSANITY.

Suppose a mother after marriage develops some mild but fixed form of insanity. She is not violent and the family does not want her sent to an asylum. In view of the pronounced hereditary taint in such cases, she should not bear children, but the only sure way we know of to prevent it is to sterilize. Up to the present time, we know of no way of improving the condition of idiots and feeble-minded women. Because of their mental state and lack of will power, they are peculiarly liable to be sinned against, and their children are only a burden to the state, augmenting the already huge numbers of the vicious and dependents. Unless confined in some institution, we believe that insane and feeble-minded women within the child-bearing age, after examination by a state appointed commission of experienced neurologists, if pronounced by them incurable, should be sterilized.

EPILEPSY.

The same is true of epilepsy. None of the last four types should be allowed to marry, and yet not long ago in our own state at Trenton a prospective bride fell in a true epileptic fit at the altar. Very often, epilepsy develops after marriage, and in view of the almost certain inheritance of this dread disease we believe that every wife, thus afflicted, unless removed from the home, should be sterilized, or at least until such time as our honored Dr. Reed can run the epileptic bacillus a little closer into its lair.

As physicians, we have recognized the danger and the menace of child-bearing in the various types of cases which have been briefly referred to, and we have attempted to combat them, but a more vigorous and determined stand for sterilization of women, when clearly indicated, would annually save thousands of lives which now are needlessly sacrificed.

PROLAPSE OF THE UTERUS.*

BY
C. L. BONIFIELD, M. D.,
Cincinnati, Ohio.

THE cause of prolapse of the uterus is a weakening of its supports, or an increase in the weight of the burden they have to bear. In many cases both of these factors play an important rôle.

The uterus is held in its normal position by its ligaments, by intra-abdominal pressure and by the relation its axis bears to the axis of the vagina. The supports of the uterus may be weakened by intra-abdominal pressure acting on the uterus in an abnormal way; by a change in the axis of the vagina due to a laceration of the perineum which alters the axis of the vagina, or by the lack of tone of its ligaments. The weight of the burden the supports must maintain is increased by subinvolution, usually due to infection, by laceration of the fascia under the posterior vaginal wall, which not only permits the posterior vaginal wall to depend on the uterus for supports, but also allows the rectum to bulge forward into the vagina and destroys the action of the levator ani muscle, leaving nothing to oppose an action of the anal sphincter.

In the act of defecation, therefore, the supports of the uterus are called upon to bear the brunt of the expulsive efforts exerted on the fecal mass, and the latter is forced through the sphincter, instead of the sphincter being opened for its passage.

In a like manner, injury to the fascia of the anterior vaginal wall permits of the descent of the bladder and the transference of more or less of its weight on the supports of the uterus. Efforts at micturition add to the stress placed upon them, because a portion of the bladder is lower than the urethra.

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As soon as the uterus has been pulled from its normal attitude of slight anteflexion, intraabdominal pressure exerts its force on the fundus rather than the posterior aspect of the uterus, and is, therefore, no longer a support, but a further strain on the already overtaxed ligaments. It is as though a rebellion had broken out in the army of defense and some of the troops had gone over to the enemy.

It is true, that we occasionally have prolapse in the unmarried, but it is rare, and no doubt in all such cases the supports of the uterus are congenitally defective. The vast majority of cases occur, as I have described, in women who have borne children. Many times the ligaments of the uterus are able to bear their burden for a number of years after the injuries of childbirth, but as the menopause approaches and the attendant weakening of the ligaments ensues, the prolapse slowly but inevitably occurs.

Recognizing how and why prolapse has occurred, the rational treatment is to decrease the weight of the uterus, replace it in its normal location and attitude, and relieve it of all its abnormal burdens.

The weight of the uterus may be decreased by rest in bed, curettage, and amputation of the cervix, which is always hypertrophied in these cases. The uterus may be held in its normal place and attitude by a Gilliam operation, or, if the patient be passed the child-bearing period, by a ventral suspension, which is a little more easily and quickly done, and the uterus may be relieved of other burdens by the proper operations on the posterior vaginal wall and perineum and the anterior vaginal wall.

All of this was recognized by the earlier gynecologists, and put into practice with a skill and thoroughness that is rather unusual at the present day. Since gynecology has become less of a well-defined specialty, there has been a tendency to depart from these rational procedures and follow the spirit of the biblical injunction "If thy right hand offend thee, cut it off;" or to put the uterus in some absolutely abnormal position and attitude.

There are probably several causes for this change in methods. The most common, I think, is that many men are doing gynecological operations who are not trained gynecologists, and cannot properly restore a badly damaged perineum, or cure a bad cystocele. Another is, a foolish desire on the part of many operators, particularly of the younger generation, to add to the number of major operations they perform, and, I am sorry to add, that the third one is, that sometimes a larger fee can be obtained for doing a hysterectomy than for doing plastic work, and finally, some surgeons do not like to take the time necessary to perform the surgical steps that result in an anatomical and physiological cure of these cases.

They argue that the patient cannot well endure the long anesthesia that is required. In answer to this plea, I submit that many surgeons are not only slow, but deliberately slow and unnecessarily slow. If ether be used and given in such a way that there is more or less breathing of carbonic acid gas, and the temperature of the patient's body is maintained by artificial heat, and the operator will attend strictly to his work, and work with even a moderate rapidity, there are few patients indeed that will not stand very well these operations at one sitting. But if the operator is determined to be very deliberate about his work, there is no reason why the operation should not be divided into two steps. I maintain that it is better to restore a woman to her normal condition by an operation that requires time and care for its execution, than to mutilate her with one that seems more brilliant and can be done in less time.

OPERATIVE TREATMENT OF PROCIDENTIA.*

BY

ARTHUR T. JONES, M. D., F. A. C. S.,
Providence, Rhode Island.

In taking up the consideration of operative treatment of procidentia, we shall deal only with those cases in which the uterus is either partially or wholly protruding from the vulva, confining ourselves strictly to the condition of procidentia, as the term is usually accepted.

This condition is found so frequently and its symptoms are so distressing to the patient, that it seems of sufficient importance to consider how, by operative procedures, we may best remedy the condition and relieve symptoms.

The mechanical support by ring or pessary is unsatisfactory in these cases, as it is necessary to have a fair perineal support to make the pessary effectual.

In most of the older patients the perineal floor is gone, which makes the utilizing of a hard rubber pessary practically out of the question.

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The large soft rubber pessary or large rubber ring cannot be recommended on account of its being impossible to keep the vagina clean in its presence and of the great tendency for it to erode the vaginal walls. As we must depend upon the distention of the walls by the pessary for support, we are increasing the condition which already exists; that is, we are overdistending those tissues which are already relaxed and redundant.

In young women with prolapse and with sufficient perineal body to retain the hard rubber pessary, we may feel justified in using it as a means of temporary relief, especially in the presence of an already pregnant uterus.

So much for the use of the pessary, which brings us to operative methods as the only satisfactory means of treating these cases.

Numerous operations have been devised from time to time, from hysterectomy in the earlier days, which was considered the only method of treatment, up to the more recent operations of interposition of the fundus uteri with the accompanying general repair of cystocele and perineum.

In the selection of an operation the age of the patient is one of the first things to be taken into consideration. If the woman is still in the child-bearing period and capable of becoming pregnant, it may be wise and necessary to choose a different operation from that which we might choose in a woman who has passed the menopause; in fact, it is very important that no operation, which does not permit of pregnancy and the patient carrying her child to term, should be performed upon any woman still within the child-bearing age.

The degree of the procidentia, the presence of tumors or disease of the appendages—the presence of erosions and lacerations of the cervix and vaginal mucous membrane, may also have some weight in determining the type of operation. Hysterectomy should not be performed on a woman still in the child-bearing period any more than one of those operations which does not permit of her carrying the child to term.

In cases of tumor of the fundus or body of the uterus, as multiple fibroids, or where disease of the appendages makes their removal necessary, it may be wise to do a supravaginal hysterectomy, after which the cervical stump is suspended with the round and broad ligaments. In connection with vaginal and perineal work, this will give the proper support and prevent prolapse of the cervix and vaginal walls.

Hysterectomy is seldom necessary or justifiable in women past the menopause, and where we have a small uterus without complications, of tumors or disease of the appendages, when such excellent results are to be had with the interposition operation. No operation for procidentia is satisfactory which does not include the proper vaginal and perineal work, as support is needed below in conjunction with any suspension or interposition operation.

In women before the menopause a moderately high amputation of the cervix, thorough curettage, repair of cystocele, and a proper perineorrhaphy should be done; then some suspension operation from above should complete the technic.

In my experience the Alexander operation for this is most satisfactory. This operation has the advantage of utilizing the largest and strongest portion of the round ligaments and permits of the increase of the size of the uterus in pregnancy without danger of miscarriage or of complications at term. Again, the ligaments regain their tone after labor, and we find the uterus in good anterior position with the round ligaments sufficiently firm and taut.

This we have observed in several of our cases following two and (in a few cases) more than two pregnancies.

The time consumed in an Alexander operation is, as a rule, less than for opening the abdomen, and there is less danger and less shock than when the peritoneal cavity is opened.

I prefer the Alexander operation in these cases to the Gilliam operation, as the areas in which the ligaments are anchored are greater and give better attachment than we get in the Gilliam. The internal Alexander, so-called, or Baldy's operation sacrifices the stronger portion of the ligaments and utilizes only the weaker ends, and has not been found as satisfactory in our hands.

The suspension of the uterus to the peritoneum is in most cases useless and ineffectual. In some cases it may amount to a fixation, and this condition we should avoid by all means. We have seen several cases of ventral fixation which were done in the earlier days and in which pregnancy followed with disastrous results.

The Coffey operation and the ordinary plication of the round ligaments again utilizes the weaker portion of the ligaments for support and sacrifices the stronger. The Alexander operation, I feel, is also a very good operation in many cases beyond the menopause, but not in those cases of old age when the tissues have become senile and atrophic.

There has been some objection to the Alexander operation on the grounds that the round ligaments were not intended by nature as supporting ligaments. This argument does not hold good in the face of practical experience for, if they can be made to do the work satisfactorily, surely we are justified in using them.

As a matter of fact, not a great amount of weight is put upon the ligaments, they still perform the function of guy ropes to steady the uterus and hold the fundus forward, so that the intraabdominal pressure is exerted upon the posterior wall of the uterus as it is under normal conditions.

We have had occasion to see a few cases laparotomized after a previous Alexander, and it has been interesting to note the apparently normal position of the uterus in these cases.

In the majority of cases beyond the menopause, especially the older patients, the interposition operation, in our hands, has been very satisfactory. It does not consume great time, there is very little shock, and after-results from the patient's standpoint, as well as the operator's, are very satisfactory.

The uterus should be curetted unless we have a small senile uterus without discharge, in which case I have omitted the curettage. The cervix should be amputated, the bladder separated from the anterior uterine wall and from the vaginal walls, the anterior culdesac opened, and the bladder pushed high up over the fundus of the uterus. The sutures are then placed, beginning posteriorly in the middle line and going around either side fitting the vaginal wall well onto the new cervix, leaving the large redundancy on either side to be cut away after putting in stay sutures, which fix the body of the uterus to the anterior vaginal wall. A careful perineal operation, bringing the levatores well together and closing the introitus to virgin size completes the operation.

The effectual cure of the cystocele and rectocele without any further evidence of prolapsing is very gratifying.

In doing the interposition operation, I have tried to follow the technic of Dr. Bandler as near as possible.

The Murphy operation, transplanting the body of the uterus between the layers of the abdominal wall after splitting the uterus and removing the endometrium, has not appealed to me, and we have not utilized it in our work. If some of the members here have had experience with it, I would like to know their end results, and if the operation has been satisfactory in their hands.

In the summing up this brief paper, I would emphasize the following points:

Consider the age of your patient first in your selection of an operation. Do not perform a hysterectomy in young women unless there is some indication aside from the condition of procidentia. Do a preliminary curettage; shorten the cervix; attend to cystocele and provide good perineal support in conjunction with any of the operations for procidentia. In women who are still within the child-bearing period, this general repair in connection with the Alexander operation gives very satisfactory results. In the presence of diseased appendages, and when intraabdominal work is indicated, we should select a different type of operation and each operator will undoubtedly be governed by the conditions found in that particular case, and do that particular operation which has been most satisfactory in his hands. For the patient past the menopause, unless we have definite indications for opening the abdomen, the interposition operation has given more satisfaction than any other method of treating this distressing condition.

CERVICAL LACERATIONS; THEIR SIGNIFICANCE FOR THE PATIENT.*

BY

FRANCIS REDER, M. D.,
St. Louis, Missouri.

(With one illustration.)

It has been to me a question of weighty import for some time why a recent cervical laceration of the uterus is not accorded the surgical attention that an ordinary wound in some other part of the body usually receives. Is it because the trauma is looked upon as trivial, or is it because the laceration is taken care of by nature and heals in the course of time by second or third intention?

It is true, a cervical laceration is not an extensive wound, nor does it ever appear as though it could cause harm. It is only occasionally that a tear in the cervix involves a vessel which requires surgical help to check the bleeding; otherwise, the trauma apparently presents nothing that calls for special attention. Furthermore, the healing of a tear usually will take place; Nature attends to that. However, when and how such healing is accomplished, has so far been regarded with little concern. On account of the concealed position of the cervix, little, if any, interest is manifested as to what is going on at the top of the vagina. The physiologic import of a healthy cervix has attracted but little consideration. When we con-

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sider that the cervical cavity serves as a reservoir to the uterine cavity proper, and that its healthy state is absolutely essential to fecundity, it becomes clearly apparent how great an asset it is to the health of a woman.

Any open wound, be it a laceration of the cervix, or a wound involving any other part of the body, invariably presents portals of entry for infection. Such wounds in our present enlightened surgical state usually receive very prompt attention, not only to hasten healing, but also to minimize the amount of cicatricial tissue formation.

Let us take, for example, a wound of the abdominal wall incurred by operation for pus in the abdominal cavity. After the suppurative process has ceased, which is usually in the third or fourth week, and granulations are well established upon the wound surface, it would not be up-to-date surgery to allow this wound to heal without giving it proper surgical help. The surgeon would draw such a wound together with sutures, thereby establishing a firm closure in about a week. If such a wound had been left to Nature, healing would have taken place, but it would have required at least three weeks to form a cicatrix consisting of a mass of connective tissue.

Cervical tears do not differ much from such wounds. Their behavior is almost identical. There is perhaps this difference; a cervix after having passed through the onslaught of labor not only presents lacerated wounds of a diverse nature, but it also shows evidence of being much bruised and swollen. Tissues in this condition must not be subjected to surgery. No good could accrue and harm might result.

A cervix traumatized at the time of childbirth will in the course of a few days be bathed in the lochial discharge. Such a discharge is foul and purulent, usually harboring microörganisms sufficiently virulent to inoculate an infection upon the wounded surface. This infection is most commonly of a mild type, because primarily the vagina and the uterus of a normal pregnant woman are free from pathogenic bacteria.

With the cessation of the lochia, which is usually in the third or fourth week, the genital parts directly concerned in labor have in a fair way assumed their normal state. However, the fact must not be overlooked that muscle tissue so compact as that of the cervix, when subjected to severe bruising, requires time for recovery. An additional four weeks will generally find the cervix in a tolerant condition, so that any surgical procedure performed on it will not be met with defeat. By this, I mean, not the performance of a classic trachelorrhaphy, for such a procedure at this time would be out of place, but merely bringing together the flaps of the torn cervix, and securing them with catgut suture after the granulating surfaces have been refreshed by gentle scraping.

This is an operation of minor importance and requires no general anesthesia. It does not confine the patient to bed, and only twenty-four hours of quiet are enforced. No after-treatment, excepting the giving of an occasional cleansing douche, is required. This operative procedure has been very properly called by Dr. Herman J. Boldt, an intermediate trachelorrhaphy.

Now let us ask this question: Has this intermediate trachelorrhaphy any material worth? If we can attribute either directly or indirectly certain gynecologic and neurologic sequelæ to a cervical tear and can demonstrate that such disturbances can be obviated wholly or partially by an intermediate cervical repair, then the question must be answered affirmatively. However, if this cannot be demonstrated, then the question must receive a negative reply.

It has long been a matter of much interest to me why so many women who have been well and strong, free from aches and pains before having given birth, should develop soon after their firstborn a condition entirely foreign to their former selves. In the common vernacular of such mothers, their feelings can be phrased (and we are all familiar with the expressions) like this: "The baby has put a kink into me," or, "The baby has taken the starch out of me," or a still more forceful one, "The baby has put me on the bum." These expressions give a fairly good idea of how such mothers feel.

A cervical laceration is an injury which, like any other trauma, causes the tissues so involved to suffer from a lowered resistance. Nature in its efforts to heal such a trauma will unbend its energies to accomplish some sort of a result.

Let us, for instance, consider the most common pathology of the cervix uteri, an erosion. The lesion is the outward sign of changes in progress throughout the cervical canal. It is the result of an endocervicitis most frequently caused by a laceration which nature could not satisfactorily heal. These lacerations are not deep, and are usually of a stellate variety. Nevertheless, we have here a trauma which has created a fertile surface for the reception of toxic products. The pathology of this condition (endocervicitis) presents itself in a rapidly moving picture from the stage of subepithelial lymphocytosis to the stage of subepithelial fibrosis. As a result, there is established a leukorrhea, a glossy, semifluid, tough, mucous discharge, produced by the follicles. When this mucus is mixed with the creamy-colored vaginal secretion, it becomes whitish; and is known by the laity as "the whites."

Nature is unceasing in its efforts at repair, and often the discharge progressively diminishes as the glands become occluded through tissue hypertrophy. Such a state establishes a permanent change in the cervical tissues and creates a condition that invites further trouble.

A well-established cervical erosion causes pain in the lumbosacral, hypogastric and ovarian regions, and ofttimes down the thighs. A nuchal pain is not infrequent. The lateral variety of cervical tears, on account of their location and their depth, forms a very important chapter in cervix pathology. When a lateral tear reaches into the zone of vaginal attachment, the efforts of Nature will scarcely succeed in causing such a wound to unite without the formation of a large amount of fibrous tissue. This does not happen when the tear is in the body of the anterior or posterior lip. The reason for this must be sought upon a mechanical basis. Be it a lateral or a bilateral tear, the tendency for the lips to gap is great. This is augmented when the patient gets up, by the intraabdominal pressure driving the cervix against the posterior vaginal wall. This pressure forces the lips of the cervix asunder, and eversion of the lower part of the cervical canal is the result. By this eversion, the mucous membrane of the cervix becomes exposed to friction and to pressure.

Such an open wound cannot escape infection; and, in the course of time, the two cervical lips give evidence of enlargement and induration, commonly designated as a hyperplasia or a hypertrophy of the cervix. Associated with this pathology, we invariably have at one time or other, or constantly, according to the general health of the patient, the cervical erosion and the leukorrhea.

If pathologic conditions were to find their limit here, the future comfort of the patient, could be given a better assurance. However, on account of the lowered resisting power of the traumatized cervix, other morbid conditions will align themselves. A laceration of this character is a common cause for the uterus to remain enlarged and congested. It is a direct hindrance to its physiologic involution, thereby greatly arresting Nature's efforts to heal these tears.

Such a condition of prolonged congestion is prone to produce alterations in the myometrium. The musculature of the uterus will eventually become relaxed and softened, causing the organ to lose its stiffness, thus favoring flexion. Later, on account of its abnormal size and weight, a retrodeviation becomes almost inevitable.

Not an unusual accession to this pathologic picture is a chronic endometritis, this condition having been encouraged by its close kin, chronic endocervicitis, after the natural barriers to infection about the internal os have been broken down.

A chronic endometritis, although not a common affection, invites a pathology very deleterious to the myometrium. It is characterized by a diffuse fibrous overgrowth and a corresponding muscular degeneration. Eventually it creates a condition known as fibrotic metritis. A uterus so afflicted is tender and soft in the earlier stages, becoming hard and painless later. Leukorrheal conditions are always present, the enlarged corporeal glands frequently occasioning a watery discharge, especially marked just after the period. The menstrual loss is excessive and is accompanied by an aching, bearing-down pain, referred to the lower abdomen, sacral region and vagina. The dyspareunia, which is frequently complained of when the uterus is tender, is likely to prevent conception. Allowing liberally as to the walks of life and the state of health these women might be in, my observation has been sufficiently convincing to make the definite inference that a lacerated cervix, when left to nature, exercises a harmful influence upon the general health of most women.

When a lacerated cervix is repaired within six to eight weeks after childbirth, it has been my experience that such repair will be a potent factor in maintaining a healthy balance in the economy of the woman.

Having cited the principal pathologic changes and mechanical deviations that frequently manifest themselves as direct sequelæ to a cervical tear, permit me to somewhat broaden the limit and dwell upon certain neurologic phenomena that depend for their origin upon just such morbid changes in the sexual apparatus as have been enumerated.

It is questionable with me whether or not a gynecologic disorder can produce a purely neurologic disease. When we speak of a reflex neurosis, we simply pass beyond the horizon of our knowledge. It is a convenient way of designating the manifestations of nerve-energy exhaustion. However, as long as there is a gynecologic pathology and a nervous system, reflex disturbances will be recognized by the gynecologist, and it will always remain a diagnostic problem to interpret rightly those nervous symptoms associated with minor lesions of the female reproductive organs from those of a distinctly nervous origin.

The equipoise of a woman's nervous organization is very unstable.

A slight jarring may disturb the balance of healthy action, causing the nervous force to wander off in strange paths, and in its erratic play reveal various nervous phenomena, such as irritability, temperamental vagaries, nervosity, periods of depression, vertical headaches and backaches.

There are few women who have a nervous system of a normal type. There are many who have congenital or acquired defects in their nervous organization. The latter obviously manifest greater reaction and more pronounced protean symptoms than the former, under the strain of a physical irritation. The protean symptoms come not from the uterus, but from a weak nervous system whose nerve tone was not strong enough to cope with the excessive irritability caused by a cervical disease. Under such a condition it is the nervous manifestations that should draw attention to a lesion of the cervix.

The sympathetic nervous system is always alert to make the most of any physical irritation; and with the aid of the endocrine glands may readily create a complex of reflex symptoms which may work physical and physiologic havoc in a woman whose nervous organization is weak. Women under such a persistent tension and hereditarily inclined toward a neuropathic disposition, are able to resist pain less, brood more over their ailments, fear more for the future, and are less able to judge calmly. Hence they feel more acutely, and readily increase their troubles by fixing their attention on them. They imagine that they are going to have other diseases, and ultimately become confirmed neurasthenics.

Another phase of this subject may weave itself about the woman having a strong nervous system, the so-called "normal type." It is assumed, and correctly so, that a cervical lesion, although producing definite local symptoms, will in a woman with a normal type of nervous organization cause no reflex symptoms. Nevertheless, if this woman has a leukorrhea which she may regard without concern for the first few months, but finds that the discharge is becoming aggravated, the barriers that keep her nervous system in normal balance will eventually weaken and sooner or later she will become obsessed by psychic influences that in every respect will parallel the condition of the woman with a weak nervous organization.

There is no doubt that continual pain or discomfort makes a weak nervous system weaker, and that anxiety about supposed disease makes a nervous patient worse.

When we endeavor to sum up the different factors responsible for these neurotic manifestations, prominence must be given to a psychic element, that is, fear, acting on a mind already taxed by the existing pregnant state. The mental factor coöperating with the exciting fear factor over a period of many months must unquestionably produce an amount of strain; under such a worry, a lowered resistance of the nervous force must result, thus making it the more easy for an irritation factor in the sexual apparatus, such as we find in the cervical lesions, to become potential in disturbing the balance of healthy action, even if the woman has a nervous system of the normal type.

When such nervous phenomena manifest themselves in a young mother, who before giving birth did not exhibit such protean reflex symptoms, it must be inferred that the key to these disorders will most likely be found in a damaged sexual apparatus, traceable principally to a lacerated cervix, and its associated lesions. It is, therefore, pertinent to assume that an early repair of a cervical lesion, such as is usually caused by childbirth, is the logical solution in anticipating endocervical disease with its distressing neurologic sequelæ.

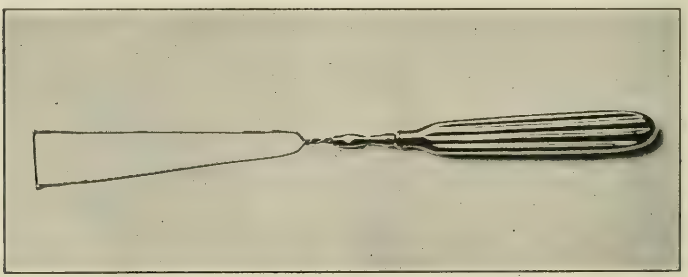

Fig. 1.—Wire curet for refreshing the granulating surfaces of the cervical tear, the cross wire taken from a Gigli saw.

The technic of the operative measure is simple and is in accord with procedures employed for all granulating wounds. No general anesthetic is required. With the patient in the lithotomy position, access to the cervix can be readily gained by inserting a Simon's speculum, care being taken not to traumatize the sensitive perineum. Surgical cleanliness is rigidly enforced.

With the aid of tenacula, the lacerated portions of the cervix are approximated as a preliminary test step. Small, partly detached tissue masses are cut away with the scissors, that a good coaptation of the torn surfaces may be obtained. No paring or cutting of the wound lips is necessary. A wire curet (the wire of this special curet is from a Gigli saw), will answer all purposes (Fig. 1). The granulating surfaces are gently curetted, particular attention being given to the angles of the wound.

Free bleeding will result. The freshened surfaces are next approximated and secured with chromic catgut (No. 3). The number introduced is governed by the extent and character of the tear. It is advisable to have a continuous irrigation while tying the sutures, that all blood from the surfaces to be approximated may be washed away. A cleansing douche is given daily for a week, and the patient is asked to remain quiet for two or three days.

ACUTE DILATATION OF THE UTERUS.*

BY

N. STONE SCOTT, M. D.,
Cleveland, Ohio.

A REVIEW of the literature, with only a score of cases by a much smaller number of reporters, gives the impression that acute dilatation of the uterus is of infrequent occurrence and of little more than didactic importance. A study of the six cases, which forms the basis of this paper, has brought me to the conclusion that acute dilatation is not rare and has furnished an explanation of this apparent scarcity.

To Kossman must be given the credit for having first called the attention of the profession to the possibility of an acute dilatation of the uterus. In 1904 he reported two cases of uterine paralysis, in the nonpuerperal uterus, with increase in size of the uterine cavity. He was violently opposed by Strassman who explained Kossman's cases on the supposition that they were due to perforation on the lateral aspect of the uterus with the passage of the instrument into the folds of the broad ligament. He (Strassman) goes on to report various illustrative cases of his own, most of them evidently examples of true perforation; one, however, answered all the conditions of acute dilatation of the uterus, though he failed to recognize it as such.

This controversy was ably discussed *pro* and *con* in the scientific societies of Europe during the next two years by Asch, Geyl, Kieffer, Schäffer, von Tussenbroeck and others.

Dr. Catherine von Tussenbroeck believes that a slight dilatation of the uterus during curettage is a frequent occurrence. She says, "I have seen this so often, I might almost say, so regularly, that everyone who is accustomed to doing curettage must be acquainted with the phenomenon." She reports four cases of her own in which the depth of the uterus was from 1 to 4 cm. deeper at the end of a curettage than at the beginning. She also reports one case of a high degree of dilatation. The patient, twenty-seven years old, was curetted for dysmenorrhea. Bimanual examination revealed a virgin uterus in sharp anteflexion. During the curetting the uterus lost its tone and changed to a flaccid sack, when suddenly the feel to the curet was as if there were no wall present. The curet was immediately withdrawn, nothing further was done except to swab out the cavity with sterilized gauze and fill it with iodoform. Ice was applied to the abdomen; there was no bleeding. Convalescence was uninterrupted.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

This author recognizes the fact that there is nothing in the anatomy or physiology of a normal uterus to prevent atony and presents a plausible theory accounting for enlargement of the organ as it occurs in connection with relaxation, pertinently adding that "relaxation of a muscle, in itself, does not constitute increase in its length." She rejects, with good reasons, Doleris' and Geyl's interpretations. The former ascribes the distention of the cavity to the stretching of the relaxed muscle by the impinging instrument; the later, to the entering fluid or air overcoming not only the passive resistance of the musculature, but intraabdominal pressure as well.

Schäffer contends that the dilatation is due not alone to motor, but to a combination of motor and vasomotor influences.

Granting that this tone relaxation of the afferent vessels occurs coincidently with the tone relaxation of the musculature, we have, then, an increased blood supply in the relaxed uterus. The atelectatic spaces (Kieffer) are filled with blood, the whole uterus swells and stiffens, like an erectile organ. If the tone relaxation of the vessels and the muscle remain entirely coördinated, the phenomenon will end as it began, simultaneously, the congestion will disappear, the muscle contract, the uterus is again in repose. However, should incoördination occur, congestion will disappear before the muscle regains its tone, the uterine wall becomes flaccid, and complete paralysis results.

This spirited discussion of atony of the uterus, carried on in the European societies for two years, has had no perceptible influence on the literature except to secure for practically all the text-books written thereafter the incorporation of the statement, that, "the uterus is subject to acute dilatation." However, as one looks up the literature on the use of the curet he will find that to-day, the same as when that useful instrument was first invented, all the authors place great stress on the danger of perforating a soft uterus and cite numerous examples to emphasize the point.

Maier, in 1906, published an interesting paper in which he says "I remember a number of cases of uterine atony occurring during the curettage of puerperal uteri, of which the following history is a type:

> Mrs. J. W., aged thirty-six, multipara. Curettage for retained secundines two weeks after a four months' abortion. Suddenly, in the midst of the curettement of the anterior wall, the instrument entered the cavity of the uterus a distance of 20 cm. Placing my hand on the abdominal wall, I felt the uterine wall contracting on the end of the instrument.

Of acute atony in the nonpregnant uterus, he says, "since the publication of Kossman's paper, I have been able to demonstrate to myself and others this tone alteration with relaxation of the uterine muscle." He further cites four cases:

(1) Sudden relaxation from a depth of 9 cm. to 15 cm.; (2) from a depth of 8 cm. to 13 cm.; (3) depth at beginning 7.5 cm. suddenly increased to 12 cm.; (4) from a depth of 9 cm. to 15 cm.

If one observer can report four cases in two years, it would seem to point to the possibility that the condition is not one of great rarity. On the other hand, when one reviews the literature and finds but scanty reference to the subject, it is natural to infer that the subject is one of great rarity. I am free to admit that, in spite of the first two cases I shall report to-day, my fixity of mental attitude on the subject, due to my early training, which was of the conventional type, and is still to be found in the modern class room, prevented my grasping the scientific import of the facts until quite recently. I am now thoroughly convinced that the condition is moderately frequent and of great importance to the patient, for if the surgeon has not the possibility of acute dilatation in mind he may cause irreparable injury, since he is prone to institute the wrong course of procedure or leave unfinished a necessary operation.

Turning to medical history, analogies of the supposed rarity of certain forms of disease are abundant and striking. It is much less than a hundred years since the inflexibility of mental attitude of the medical men of his day led to the persecution of Semmelweis when he announced his belief that puerperal fever was infectious. All of the older men of this Society have a personal recollection of the period prior to 1886 when appendicitis was considered a great rarity; moreover, many members of this society have been leaders in the movement which has in so short a time educated not only the profession but even the laity to a realizing sense of the frequency as well as the treacherousness and oftentimes the insidious character of appendicitis.

The present generation marvels at the attitude of mind of the fathers in the profession in regard to the questions in connection with the frequency of appendicitis, extrauterine pregnancy, ulcer of the stomach and a host of others; may it not be possible, nay, is it not even probable, that the next generation will review the opinions of this generation in regard to the question of acute dilatation of the uterus in much the same way?

As a basis for this paper, I wish to report the following six cases, four from my own practice, and two from that of Dr. A. C. Scott, of Cleveland:

Case I.—Twenty-five years ago, while associated with my father, the late Dr. W. J. Scott, a young woman came under our care suffering from a miscarriage. She was twenty-six years of age, two and a half months pregnant, the mother of one child, two years old. Her temperature and pulse were normal; she was in good physical condition. The uterus was not unduly large for a ten weeks' pregnancy, and was normal in shape and position. On account of the hemorrhage, which was not excessive for that stage of the abortion, a curettement was decided upon and was begun in the operating room of the Cleveland General Hospital.

The interior of the uterus was gone over carefully, the normal amount of placental tissue, corresponding to the age of the pregnancy, was removed, after which the feel of the uterine wall was entirely normal. The site of the placental implantation was the right uterine cornua. With the removal of the placenta, the bleeding materially lessened. I was just on the point of stopping the operation when, as a matter of extra-precaution, I decided to lightly explore the uterine cavity. I did so and as I passed the curet toward the right cornua, it suddenly went in up to the handle; it went in easily, without the application of any force; it seemed as if there were no uterine wall to oppose the instrument. There was no increase of bleeding, no shock, in fact no appreciable change in the general condition of the patient. An immediate consultation was held, and we decided that it was probably a uterine perforation, and that our best course was to return the patient to bed for observation, with the expectation of opening the abdomen should any unfavorable symptom supervene. Further treatment was, however, unnecessary as her convalescence was all that could be wished. I am now satisfied this was a case of acute dilatation.

Case II.—Fifteen years ago, in response to an urgent request, I found Mrs. B. in the midst of a miscarriage of a three months' pregnancy. She was a large woman, weighing 220 lb.; aged thirty-four years; the mother of two healthy boys, aged ten and seven years, respectively. This was her fourth pregnancy, she having had a miscarriage several years before at about the fourth month. The temperature and pulse were normal and a vaginal examination revealed nothing out of the ordinary. A tamponade was employed to control bleeding, while preparations could be made for an operation, which was carried out in the course of a couple of hours. On removing the tampon, it was found that the size of the uterus was much increased since the former examination; its superior outlines were very indistinct; in fact, with the exception of the cervix, the uterus could scarcely be palpated; even the cervix partook of the flaccidity and was easily dilated.

The interior of the uterus contained a quantity of blood-clots, but not enough to account for the size of the uterus, which was fully 12 inches in depth. No fetus was found; the placental implantation was high up in the left horn, not larger than a normal four months' pregnancy. With the removal of the uterine contents, there was a great reduction of the bleeding, although the uterus did not contract down, as does a normal uterus at term when its contents have been expelled. The uterus was lightly packed with a strip of gauze, and a hypodermic of ergotol was administered. The after-treatment consisted of the administration of 2 grains each of ergotin and quinine once in three hours. By the second day the uterus had apparently contracted down, after which convalescence was entirely uneventful.

Case III.—Mrs. D., aged twenty-three years, a short thick set woman, the mother of one healthy boy, four years old; had always enjoyed the best of health. During her second pregnancy, intercourse seven weeks after menstruation was not painful at the time, but a couple of hours later, during the night, was followed by a severe pain, which was accompanied by a moderate bleeding, which subsided in about two days, and for two weeks nothing further was noted. Then at night, at about the end of the second month of pregnancy, she was awakened by a severe bleeding, which was not attended by any pain.

By the time I reached the patient the bleeding had almost ceased. Rest in bed and an opiate were prescribed, but on the second day it became evident that the loss of the fetus was inevitable and a curetting was advised. At this time we ascertained that the uterus was 4 inches deep.

She was taken to Emergency Hospital, etherised and prepared for operation. On making a preliminary examination, I was struck by the changed condition of the uterus; my first passing thought was that the uterus was much smaller than at the time of the examination during the consultation. On careful examination, I determined that what seemed to be the small uterus was only the cervical portion, and that the body was much larger and almost indistinguishable. There had been a very great change from the conditions found a few hours before. The character or amount of the bleeding had not been altered.

On passing a probe into the uterine cavity it entered a full 12 inches in the mid-line, but at either side the depth was 14 inches, the instrument could be felt, apparently, just under the abdominal wall. The uterus seemed to be empty; for some little time nothing was removed by the curet but a little free blood, no clots, no placental tissue, no fetus. I had gone over the entire uterine cavity with ordinary thoroughness and found nothing, save a few shreds of membrane. Dr. Koller, chief of the hospital, who was assisting, remarked: "Did you say that she is less than three months pregnant?"

On being assured that he was correct, he said (with, as it seemed to me, a decidedly skeptical look on his face): "A uterus the depth of a full term uterus, it seems to me a very remarkable case."

We then again went over the uterus carefully and found nothing until we came to the left horn; here the curet first brought away a little placental tissue. At the extreme tip of the left horn the placenta was found, the curet had at first passed entirely over it, but the amount was not more than would be expected with a pregnancy of ten weeks.

As soon as the placenta was removed, the bleeding very much diminished, as happens with any ordinary miscarriage, and this notwithstanding the uterus still remained in its dilated condition. It was thus evident that the diminution of the bleeding was due to the inherent hemostatic properties of the blood and the blood-vessels, and not to the control of the bleeding by the contraction of the uterus, as is apparently the case following normal delivery at term.

The operation was completed by swabbing the uterine cavity with iodine solution and lightly packing the uterine cavity with gauze. Ergotin and quinine, two grains of each, were given once in three hours; by the following day the uterus had contracted to almost its normal size, and from then on convalescence was uninterrupted.

CASE IV.—Two years ago Dr. A. C. Nash telephoned me saying: "I wish you would see a patient with me, she has a condition such as I have never seen before; she is a well built German woman, thirty-five years old; has had three healthy children; in this her fourth pregnancy she has aborted at two and a half months. I saw her yesterday and removed the ovum which was lying in the vagina. I am positive it could not have been more than a three months' pregnancy. The amount of bleeding both before my call and after has not been excessive, not more than one would expect with a three months' miscarriage; her temperature and pulse are normal. I have explored the inside of the uterus with a curet, it is perfectly empty, and yet she has a uterus which extends as high as the umbilicus and is 8 inches in depth."

I saw her in consultation twenty-four hours after the completion of the miscarriage and confirmed the observations.

Mrs. K. was estimated to be 5 feet, 5 inches high, and to weigh 120 pounds. Her temperature was 98.2° F., her pulse 72. All the vital organs, aside from the generative organs, were normal. The abdomen, owing to former pregnancies, was flaccid, covered with only a moderate panniculus adiposus, not over three-quarters of an inch thick, permitting an easy examination of the abdominal and pelvic organs. The uterus extended to the umbilicus; its consistency was decidedly flabby; the fundus was irregular in outline, due to the presence of a small fibroid situated in the left horn. On exploring the uterine cavity a small amount of blood was seen to trickle slowly out of the external os, but with this exception the uterus was entirely empty; there were no blood clots present, although the depth of the uterus was 8 inches from the external os to the fundus. Its walls were carefully explored with a dull curet and were perfectly smooth; the site of the implantation of the placenta could not be determined; nothing abnormal was found except the size of the uterine cavity and the fibroid in the left fundus. There was not, as a result of the exploration, any excessive hemorrhage, nor had there been at any time during the miscarriage.

The uterine cavity was swabbed out with an iodine solution, lightly packed with gauze, and the patient returned to bed in excellent condition. Two grains each of ergotin and quinine were given once in three hours. The following day the gauze packing was removed; the size had diminished more than half; in another two days the uterus had returned to its normal dimensions. From this time on convalescence was uneventful.

The history of this case corroborated and emphasized the thought which had come to me while treating the former case, that is, that the size of the uterine cavity which it may assume, without overdistention, depends mainly upon its growth prior to pregnancy, and that the great growth due to the increase in size of its musculature during pregnancy is for the expulsion of the fetus primarily, and has little, if any, bearing upon the capacity of the uterus. This same theory holds true of muscular development elsewhere; the thin arm has just as great amplitude of motion as the thick one, but is deficient in power, so also of the uterus in a somewhat similar way.

In addition to these four cases of my own, I have a personal letter giving the details of two similar cases, which have occurred in Cleveland and seem to me worthy of record.

Case V.—Patient, aged thirty-two years, has three children, all healthy. She had a miscarriage at about four months, dating from the last menstruation; conditions found at the time of operation corresponded with the history. Patient was seen first one week after the onset of the miscarriage; at this time there were symptoms of sapremia, with bloody discharge of a foul odor. Under ether anesthesia the uterus was explored and found to be five inches to the fundus; the body of the uterus was soft to the touch.

After the usual preparations, an attempt was made to empty the uterus of its contents, consisting of the greater part of the placenta, and blood clots. There was quite profuse bleeding upon detachment of the placental fragments.

During the operation, and after the detachment of the placenta, upon inserting a curet the walls of the uterine cavity could not be reached. The first impression was that the softened wall of the uterus had been perforated with the curet, although care had been taken throughout to avoid this accident. One blade of a long placental forceps was carefully inserted, the upper part of the uterus was reached, and with a hand on the abdomen this could be felt just above the umbilicus. The bleeding at this time was not perceptibly increased. A hot intrauterine douche was immediately used with manipulation and massage of the uterus over the abdomen, and the anesthetic stopped. Under the influence of the heat and massage, the uterus was felt to contract with the expulsion of considerable blood clots. A dose of ergotol was given hypodermically. There was only slight bleeding during the day. The patient made an uneventful recovery.

Case VI.—This was similar to the case just detailed, although the dilatation was not so high a degree, a miscarriage at three months with a sapremia. The uterus was felt to dilate while curetting and was followed immediately by firm contraction.

From a careful study of my own cases and those of others, I have come to the following conclusions although I realize that the number is too small, and the territory traveled is too new, to furnish a basis for dogmatic assertions. I doubt not but that some of these conclusions may be modified.

Acute dilatation during the early months of pregnancy presents a marked difference from acute dilatation at term, in that it has no appreciable influence upon the bleeding. The more or less complete hemostasis occurring after the complete separation of the placenta, after an ordinary miscarriage, depends upon the hemostatic properties of the blood and blood-vessels, and this is not materially modified by an acute dilatation.

A uterus at full term, which has been emptied of its contents, will have an alarming hemorrhage, if it does not contract down and control the bleeding by muscular action. This is due to the changes in the blood-vessels which have taken place during the pregnancy. Should a contracted uterus lose its muscular tone and again dilate, the same alarming hemorrhage will supervene.

Some of the authors believe that acute dilatation is a phenomenon of sepsis. Maier thinks acute dilatation will only occur where there has been a prior disease of the muscle wall.

It seems to me that the cases reported to-day bear out the theory that the lesion must be in the uterine cornua, where interference with the uterine innervation will be most marked. Three of my cases had a placental implantation in one or the other horn, and the fourth had a small fibroid in the same place. Among the cases reported, great dilatation occurs only in those which had been recently pregnant.

Acute dilatation of the uterus is not the rare condition a study of the literature would seem to indicate and is one of great clinical importance.

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CARCINOMA OCCURRING IN THE STUMP OF THE CERVIX, FOLLOWING SUPRAPUBIC HYSTERECTOMY.*

BY

EDGAR A. VANDER VEER, M. D.,
Attending Surgeon, Albany Hospital,
Albany, N. Y.

A RECENT case of carcinoma of the cervix following operation for the removal of a fibroid tumor of the uterus, led me to investigate this subject somewhat, in an endeavor to determine whether or not this is a common occurrence; and in the service of Dr. Albert Vander Veer and myself, at the Albany Hospital, I could find but two cases. However, a search of the literature shows this condition to occur more frequently than is generally acknowledged.

In this country two very excellent papers have been written: one by Dr. Andrew F. Currier, of Mount Vernon, N. Y., and published in the transactions of the American Gynecological Society for the year 1906, and the other by Dr. Veader Newton Leonard, of Baltimore, Md., and published in the *Annals of Surgery* for September, 1913. The latter gives a complete bibliography up to that time, and reports two cases occurring in the Gynecological Clinic of the Johns Hopkins Hospital. In all he found a total of somewhat less than sixty cases reported. A letter received by me from Dr. J. F. Baldwin, of Columbus, Ohio, reports five cases more. The letter from Dr. Baldwin is as follows:

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

"I notice in the preliminary program of the American Association, of Obstetricians and Gynecologists, that you are to have a paper on carcinoma occurring in the stump of the cervix, following a supravaginal hysterectomy. If your paper is a statistical one, it ought to be of great interest and value.

"A number of years ago I changed my technic from supravaginal- to pan-hysterectomy in practically all cases of women who had had children, or in whom there was anything but a perfectly healthy condition of the cervix. I was induced to do this because of having five cases of cancer of the cervix following the incomplete operation, in none of which had there been the slightest suspicion of malignant disease at the time of the operation.

"I do not suppose that the removal of the body of the womb predisposed the cervix to cancer, but had I not operated in these cases the cancer would have developed just the same. For a good many years, however, I have been making the complete removal as described in the paper which I presented at our Association in Indianapolis last September (1916), a reprint of which I will mail you, since perhaps you may be interested in nitrous oxid-oxygen and anoci-association as well, as in hysterectomies."

This letter of Dr. Baldwin is of great importance, as it forcibly impresses upon us the fact so well known to the general surgeon—grafting or exciting to action in diseased tissue or cicatrices not perhaps well healed, as seen in amputations following old military wounds, burns and other like conditions. It is interesting to notice his clearness of observation in his views in favor of panhysterectomy as applied to married women who, having had children, are so likely to be left with more or less traumatism of the outlet of the uterus. There can be no doubt that in following his conclusions we are doing our best for the patient.

The histories of our two cases, briefly, are as follows:

CASE I.—Mrs. G. M., aged forty-eight years, widow, housewife. Operation for removal of cervix, Nov. 12, 1915. Some ten years before was operated upon for a fibroid tumor of the uterus, the stump of the cervix being left in. Patient made a good recovery, did nicely for a year previous to the second operation, when vaginal discharge and hemorrhage commenced. Examination of the cervix showed some ulceration, and the pathological examination, made from scrapings of the cervix and portion of cervix removed, showed the condition to be carcinomatous. Cervix removed through the abdomen. Uneventful recovery. Patient has been absolutely well since.

I would say here that in doing a second abdominal operation for relief of pelvic trouble, which might be reached through the vagina, I take into consideration the original cicatrix, and if there be any point of weakness or ventral hernia, or marked symptoms of intestinal adhesions, then I am quite sure to go above through the old wound, though in this case no such complications presented; she had never been pregnant and the vagina was not dilated.

CASE II.—Mrs. T., aged forty-eight years, operated upon two years previously for fibroid tumor of the uterus. Uneventful recovery. In May, 1917, discovered a bloody and foul discharge from the vagina. Stump of the cervix found ulcerated and a granulating mass presented. Cervix removed through vagina. Uneventful recovery. Pathological report; "Chronic inflammatory condition, probably carcinomatous."

I should also like to report the following case, through the courtesy of Dr. Leonard Freeman, of Denver, Colorado, who saw it in consultation with Dr. William S. Bagot, whose letter follows:

"Saw Mrs. —, aged thirty-eight, with a history of fibroid of some duration. Operated upon Dec. 29, 1913; suprapubic hysterectomy. Tumor about the size of a five months' pregnancy. There were many adhesions, complicated with long-standing pus tubes. At the time of the operation cervix appeared healthy. After her return home, February, 1914, she continued to have some discharge from the cervix, and was treated over a considerable time by her family physician, with local applications to the cervix and the cervical canal; no marked benefit following.

May 15, 1917, she again came under my observation, suffering from a profuse discharge and pain in the lower abdomen, sacral region and down the thighs. An advanced carcinoma of the cervix, involving the left lateral fornix of the vagina and extending up into the base of the left broad ligament, presented, and diagnosis of epithelioma of the portio vaginalis was made. This was confirmed at consultation with Dr. Leonard Freeman, who advised the curettement and thorough cauterization of the cervix with the Paquelin cautery, cooking the tissues left as thoroughly as possible. Since then she has been treated with the *x*-rays. Patient's condition remained about the same. Some months previous to May, 1917, her physician had been making frequent applications of carbolic acid to the cervical canal. Whether or not this could have been a factor in the case it is hard to say.

This condition of carcinoma of the cervix seems to have been recognized in Europe for some time, and Currier was the first to call our attention to it in this country.

The subject condenses itself into this problem, whether the condition is present before operation and is not recognized, or whether it occurs as an entirely new pathological condition arising subsequent to the original operation. It is fair to assume that cases which present within a reasonable period after a suprapubic removal have had present the cell proliferation of malignancy.

In the late cases, as No. 1, it would seem to be an entirely new growth.

It is a well-established fact that carcinoma occurs in myoma of the uterus, and is only discovered in the pathological laboratory, so that it would not be unusual if in a case of hysterectomy, where the tumor occurred near the cervix, and possibly extending into it a beginning carcinoma of the cervix, it should not be discovered and be left behind, later to manifest itself. Furthermore, our methods of diagnosis are now so complete, and our examination so thorough, that a carcinoma present, before operation, in the cervix or external os, would be likely to be recognized and removed at the first operation.

The question as to whether or not a complete hysterectomy should be performed in every case, because of this complication, is a debatable one and has advocates on both sides. But the opinion of the majority seems to be that the advantages of a hysterectomy, with the cervix left in, far outweighs the dangers of a complete hysterectomy, even with the possibility of a carcinoma developing in the stump. Consideration of the thousands and thousands of hysterectomies that have been performed, and the very few cases of carcinoma of the cervix that have been reported as following, develops the fact that the danger is almost *nil* and can practically be avoided by a careful examination and diagnosis before operation. And where it does follow, prompt recognition of the condition and removal of the cervix will result in a complete cure.

Whether at the second operation the abdomen should be opened again or the cervix removed *per vaginam*, is also a debatable point. It would seem that in those cases where the pathological condition is recognized early, and where the growth is strictly localized, that removal *per vaginam* is the best method to pursue, on account of its simplicity and reduced shock and danger to the patient. On the other hand, where the growth has extended beyond the cervix and involved the vaginal walls or the remnants of the broad ligament, operation from above should be considered.

In our service at the Albany Hospital, when doing a hysterectomy, whenever possible we leave the cervix, in order to preserve the vault and floor of the vagina. In the majority of cases we have opened the abdomen and performed the hysterectomy, not disturbing the cervix in any way. Possibly it might be well in certain cases, especially in married women who have borne children, to primarily operate upon the cervix and repair any lacerations which might be present, thus adopting such prophylactic measures as we can. On the other hand, in cases of severe lacerations, with more or less ulcerative processes presenting, and with the experience given us by such able operators as Baldwin and others, is it not the better method to do a complete panhysterectomy? With no lacerations, with no evidence of malignant involvement of the cervix, then the supravaginal procedure is the best. As we all know, carcinoma is bound to occur in a certain number of cases of laceration. As a rule, we must not forget that this repair of the cervix prolongs the shock of the operation and this precaution is not to be ignored.

Whether the condition occurs more frequently in married or unmarried women, statistics do not show. Myoma, occurring more frequently in unmarried women, might possibly point to the thought that it would occur more frequently in that class of cases. On the other hand, if, as it is generally considered, lacerated cervix predisposes to carcinoma of that organ, we would naturally infer that it would occur more frequently in women who had borne children.

It would seem that, in those cases where the disease appears within a few months after the original operation, the condition was present at the time of operation but was not recognized. Where the disease appears several years after operation, it is fair to assume that it is a distinct pathological condition. Primary carcinoma of the cervix, as shown by statistics, being much more prevalent than primary carcinoma of the body of the uterus, it is not to be wondered at that cancer of the cervix might be overlooked at an operation for myoma of the uterus.

A preliminary curettment for purposes of diagnosis is to be recommended in all cases where the diagnosis is at all uncertain. Where the report is nonmalignant, of course, further operative intervention is unnecessary. I am of the opinion that in all cases with a pathological condition present, no matter what, where a secondary operation is necessary, the less we do at that operation, within the limits of safety, the less the shock, the better it is for the patient, and the better our mortality rate. In a great percentage of our cases, I do not believe that our patients stand the secondary operation as well as the primary one.

CONCLUSIONS.

1. Carcinoma of the cervix does occur in a few cases following suprapubic hysterectomy. Because it does so, it is not a point in favor of a panhysterectomy exclusively.

2. The dangers of a panhysterectomy are greater than the risk of a carcinoma occurring secondarily in the cervical stump and being promptly treated.
3. A careful examination should be made of every cervix before the hysterectomy is performed, particularly in women who have borne children.
4. In every case of hysterectomy, the patient should be advised to report promptly if there is any appearance of a vaginal discharge, a curettment done, and a laboratory examination made.
5. Removal of the cervix *per vaginam* is certainly to be preferred to opening the abdomen in every case where the disease has not progressed too far, as well as in cases having any discharge.
6. All cases of this condition should be reported.
7. Routine pathological examination of the myomatous uterus at the time of operation should be done, and in this way unsuspected cases of carcinoma of the uterus, also of the cervix, will be discovered and the proper operation then performed.

RECURRENCES AFTER "FIVE-YEAR PERIOD" IN CARCINOMA OF THE CERVIX.*

BY

X. O. WERDER, M. D., F. A. C. S.,
Pittsburgh, Pa.

THE accurate and carefully prepared statistics of cancer operations which give us the end results of the radical treatment in the hands of various operators show with what care and oftentimes considerable labor many gynecologists follow up their operative cases during the first five years until they have reached what is generally considered their harbor of safety. That such careful surveillance and a complete report of the results obtained are of the greatest value and importance in the study of the treatment of cancer, is so evident that the gynecologist in command of considerable material would fail in his duty to neglect this rather onerous task. His interest in these cases, however, should not cease with the termination of the "five-year period," but should continue during the succeeding years, because literature records many cases of late recurrences, some of them many years past this period. The writer has reasons to believe that such late recurrences are considerably more frequent than has generally been supposed. The subsequent history of cancer cases, particularly those of the cervix, should, therefore, prove to be an interesting, as well as an instructive, study which has not received the attention it deserves.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

According to Labhardt, the time of the appearance of these recurrences depends to a great extent on the organ in which the primary cancer neoplasm developed. He mentions the fact that in carcinoma of the breast late recurrences are considerably rarer than, for instance, in carcinoma of the rectum. Jordan reports a recurrence nineteen years after operation for carcinoma of the tongue. The cervix is apparently much more favorable for late recurrences than the corpus uteri. In Wertheim's clinic no recurrences after three years were observed after hysterectomy for cancer of the body of the uterus, while following the cervix operation they were comparatively frequent. Such late metastases have also been reported by Winter, Reinecke, Mackenrodt, Ries and others, occurring from five to eleven years after operation. Most of these reports, however, refer to cases operated upon by the older methods before the present more radical operations came into general use. Weibel(1) deserves the credit for having been the first one within recent years to carefully scrutinize the material of a large clinic, that of Wertheim, for late recurrences after the Wertheim operation, and the results of this investigation deserve a careful study.

He found in 185 cases which survived the operation at least five years, thirteen late recurrences, of which eleven occurred during the sixth and seventh, and two during the seventh and eighth year after operation; in at least eight of these, clinical as well as anatomical, evidences of cancer were found in the pelvis. Examinations of the glands removed at the operation showed them in nine cases to be free from cancer, and in four they were distinctly carcinomatous. This would seem to demonstrate the fact that, in spite of the presence of cancerous glands, patients may enjoy years of good health and freedom from all evidences of cancer.

In a paper read before the Third Clinical Congress of Surgeons in New York City in 1912 ("The Cautery in the Radical Treatment of Cancer of the Cervix"), the writer in giving the results of this operation, also referred to the subject of late recurrences which had occurred in his practice. Since then we have continued our efforts to keep in touch with all our cases, not only during the first five years after operation, but after that date up to the present year, and in many instances practically up to the present day. All the cases here reported have been operated upon for cancer of the cervix by the radical cautery operation or igni-extirpation as this procedure may be properly termed. The operation consists, briefly, in a rather high cervix amputation with the cautery knife at a dull red heat, which leaves a perfectly dry, charred wound cavity in the vagina.

The abdomen is then opened, and after tying off the infundibulo-pelvic and round ligaments, the lower uterine attachments, including broad and sacrouterine ligaments, are then thoroughly cooked between the blades of an electro-thermic clamp devised by Downes in which they have been grasped. No ligatures are needed after the removal of these clamps, as hemostasis is complete, and the tissues thus treated remain absolutely dry.

The writer during the last twelve years has performed this operation on eighty-seven cases of cancer of the cervix, with five deaths, or a mortality of 5.7 per cent. In fifty-nine cases the operation dates back five years or longer; of these twenty-seven have survived the five-year period or 45.76 per cent. Ten of these have died since then, two from an intercurrent disease, and eight from a recurrent carcinoma from five to nine years after operation. In only five cases was it possible to gain any knowledge of the exact location of this recurrence. They were:

Mrs. J. E. Operation, Sept. 18, 1906. Age at operation forty years. Recurrence at right upper quadrant in the form of mass, probably lumbar glands. Death, after five and one-half years.

Mrs. D. P. B. Operation, May, 1906. Age at operation forty-eight years. Symptoms began several months before her death, which were vomiting, with pains in epigastrium and the middle dorsal region. They continued up to the time of her death, six years after operation. No definite enlargement in these regions was palpable at any time. The diagnosis of the attending physician was carcinoma of retroperitoneal glands involving the spine.

Mrs. C. L. Operation, May, 1908. Aged forty-seven. Pain and enlargement noticeable in the left iliac fossa. Death, six years after operation.

Mrs. S. Operation, Oct. 25, 1905. Aged forty-nine years. Death, March, 1912, from carcinoma of the liver, six and one-half years after operation.

Mrs. G. N. L. Operation, Sept. 24, 1907. Aged fifty-seven years. Carcinoma of the left breast developed eight years after operation which was removed, but an early recurrence took place in the mediastinum according to the report of her physician. At no time was there a recurrence in the abdomen or pelvis. Death, nine years after operation.

In none of these cases, three of whom were examined personally by the writer, was there any evidence of a recurring neoplasm either in the vagina or pelvis. In four cases in which we have clinical data regarding the seat of the recurrence, both symptoms and physical signs pointed definitely to the glandular system as the location of the metastatic development, though in none of them was there an autopsy held to substantiate these clinical findings. They all can, I believe, be safely classified as late recurrences. In the fifth case, however, in which carcinoma of the breast developed and death occurred without any evidence of malignant disease in either abdomen or pelvis nine years after operation, an etiological connection between the two neoplasms seems more than doubtful. and we may look upon it, as, in all probability, a new and independent development, and not a recurrence.

A comparison between Wertheim's statistics and those of the cautery operation brings out some interesting features in this connection which merit closer attention. Jacobson(2) gives Wertheim's operative mortality in 714 cases as 16.6 per cent. and his cures as 42.5 per cent., while the writer has a mortality of 5.7 per cent. with the cautery operation and five-year recoveries of 45.76 per cent., results which speak decidedly in favor of the cautery treatment.

When we review the cases after the fifth year of operation, however, that is, those which are ordinarily regarded as cured, conditions change in a very marked degree, for while Wertheim records only 7 per cent. of recurrences, the writer has 29 per cent. This remarkable difference in late recurrences following the two methods of radical treatment of cancer of the cervix has caused the writer much careful reflection. While no conclusive solution of the problem can be offered, an explanation will be attempted, which, at least, seems to be sufficiently plausible to deserve consideration. Assuming that practically all late recurrences, excepting the purely local ones which must be quite rare, are glandular in origin, it might be suggested that the extirpation of the regional glands in the Wertheim operation is responsible for the difference in the late results. When we consider, however, that in nine cases out of the thirteen late recurrences no glandular involvement was found at the time of operation, this argument, to say the least, is far from convincing. It seems much more reasonable to attribute the small number of late metastases to the same influences which account for the poorer results obtained in the hands of excellent and skilful surgeons, notably here in America, who, though doing a successful and thorough Wertheim operation, are unable to approach the number of cures obtained by Wertheim himself. To attribute this to a lack of skill or to a defective technic, would be absolutely unfair and unjust; the truth of the matter is that they are working with a different class of material in which the proportion of far advanced cases is much larger than ordinarily found in the large European clinics. It is, furthermore, a well-known fact that when the glands removed in the radical cancer operation are carcinomatous, the prognosis in regard to a permanent cure is very unfavorable as can be demonstrated by a study of Wertheim's own statistics. The regional glands removed at the operation are adjacent to the diseased organ and in proportion to the masses of lymphatic structures directly or indirectly connected with the uterus they are quite few in number. Is it not reasonable to suppose that some of these may have escaped metastases, while some of those more remote and not within the field of operation are involved and cancerous? These may remain quiescent under certain influences at present very little understood, possibly for many years, but sooner or later active development may take place in the form of a late recurrence. That would account for the recurrences in Wertheim's cases in which the glands were free from disease at the time of operation. This argument, then, would lead us to the conclusion that the more unfavorable the material we are dealing with at the operation, the more recurrences we must expect.

If the proportion of late recurrences is greater after igni-extirpation than after the other radical operations, or, in other words, if these metastases remain dormant for a longer period, would it not suggest the presence of some agent, probably produced during and by the action of the intense heat upon living tissues, which has a specific effect upon the cancer cells lodged in the lymph-channels?

If there is such a toxic product, be it chemical or in the form of toxines, it is evidently not absolutely destructive to the disease elements, but it seems to retard their development and render them innocuous for an indefinite period, thereby adding years to the patient's life and health.

In order to avoid recurrences, be they early or late, we must get our cases early, before the lymphatic system has become invaded by the cancer cells. The present radical operations are now fairly successful in removing the neoplasm as long as it is localized in the uterus and to a limited extent even in the parametria, but as yet we are practically powerless to deal with carcinoma effectively when it has found its way into the lymphatic channels.

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RADIUM; FURTHER CLINICAL OBSERVATIONS.*

BY

DOUGLAS C. MORIARTA, PH. G., M. D., F. A. C. S.,

Saratoga Springs, New York.

I HAVE a very keen appreciation of the ability of my listeners, both to determine and to differentiate the value of clinical measures; nevertheless, I am before you to-day with essentially the same subject matter that I presented at our meeting a year ago, for I am sure that the unique action of radium is not generally appreciated.

Evidence accumulated in my work during the year has so strongly emphasized this fact, and so deeply impressed me with the miraculous power of this remedy for the alleviation of the many distressing symptoms associated with cancer, that I felt urged to speak of it again. Our minds do not seem to comprehend the results reported from the use of radium, even though they are from authorities ordinarily considered unquestionable.

It is, perhaps, no wonder that we are skeptical concerning the usefulness of this new therapeutic measure, for eminent men are at variance over it. Research workers have been quoted in the secular press as stating that radium is not a cancer cure; that it does not control metastases, and that sometimes it even stimulates the growth; while, on the other hand, clinical workers, men of equal skill, are continually reporting their successes. So it is not surprising that radium has been discredited by people generally, and that the sentiment prevails that the results obtained are accidental, and that radium is only an extravagant toy in the hands of a few enthusiasts.

Those who have worked with radium are usually enthusiastic; for the comfort and relief actually given in individual instances to the cancer victims, beggars description. I am not familiar with a single worker with radium who does not, somewhere in his reports, make the positive statement that radium controls pain, hemorrhage, discharge and odor, and produces a condition of comfort and hope in the hopeless cancer case.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

Such men as Clark, Aiken, J. H. Miller, Kelly, Ransohoff and others, state emphatically that radium does what no other therapeutic measure has ever done for these cases. These statements are capable of demonstration, and when corroborated over and over again, make it certain that only time is required to have the value of radium conceded.

The dominant points in nearly every adverse discussion of radium are that the patient did not live five years after its use, and that metastases developed. Two pertinent factors are ignored: *First*, that in our hopeless, inoperable cases of cancer pain, odor and hemorrhage are relieved and the life of the patient made more endurable, if not prolonged. I venture to illustrate by reciting one case.

H. L., aged seventy, male, person of unusual sensitiveness, consulted me last December for dysentery. On inquiry, I found his chief distress was from the constant discharges from the anus of gas, fecal matter, pus and blood, so that he was obliged to wear a protective dressing and remain apart from his friends. On examination the entire circumference of the rectum, prostate and sphincters were found to be markedly indurated and functionless. Radium was applied, and in four weeks all the induration about the sphincter and the lower half of the rectum had disappeared, and the sphincters resumed their function. He died about four months later.

I mention this case simply to speak of the comfort and cheer afforded both the patient and his family. It may not seem, as you listen, much of an achievement; but if you had experienced the gratitude of the family, as I did, you would think such an alleviating measure worth while, particularly as it was free from pain, distress and danger. This is but one of several similar experiences.

The fact is often ignored that surgery, and all other known measures, are helpless to arrest the ravages of cancer when it has developed to the extent under discussion.

One might just as well refuse the victim of auricular fibrillation the benefit of digitalis, because the condition is not a curable one. That this demonstrated therapeutic knowledge of radium should be discredited to-day is on a par with the practice of those men who assure the women who consult them at the menopause for pain accompanied with uterine hemorrhage, that the condition is a transient one, and that they will be all right when the period has passed, and so send them on to destruction.

And usually these men do not trouble to make an examination. In this connection, I might say that Dr. Ernest V. Smith, formerly of the Mayo clinic, states that 65 per cent. of 100 cases of uterine cancer, which he reports, had consulted two or more physicians before he saw them and that no vaginal examination had been made.

There are two fields in which the value of radium does not admit of controversy: *First*, as an adjunct to surgery in those cases where all the growth is not, or cannot be, removed, and *second*, as a palliative in inoperable cases.

This second field suggested for the use of radium is the one I wish to emphasize particularly when the region attacked is the cervix uteri.

When *is* a case of cancer of the uterine cervix inoperable? To determine this correctly is the acme of skill and is of paramount importance to the patient. If the cancer cells are not disseminated beyond the probable surgical field, surgery is the choice of procedure. To differentiate carcinoma in its incipiency is not easy, authoritative statments to the contrary notwithstanding; and the only unfailing way is to examine the suspected tissues under the microscope. Such a procedure is open to criticism, for if a cancerous condition exists, we may stimulate its development, or even infect adjoining tissues, when excising the specimen for examination; and if it did not exist it would be putting our patient to unnecessary annoyance and discomfort. Yet I see no other positive way in diagnosing doubtful cases. Unfortunately the beginning of these cases is insidious, and many times the patients do not come to the physician until the disease is well advanced.

What is the percentage of inoperable cases of cervical cancer as they occur in our practice?

For statistics in this particular, I quote from the report of Dr. John G. Clark, of Philadelphia. In an address before the American Radium Society last June, Dr. Clark stated that of all the cases of carcinoma of the uterine cervix which had come to the clinic of the University of Pennsylvania during the past three years, 90 per cent. were inoperable.

Now, what can be done for these cases? Surgery, *per se*, is helpless. Caustics are manifestly inadequate in advanced cases, carrying a prospect of functional disturbance and invalidism, together with a decidedly questionable prognosis. I fail to see how cancer cells, which have become broadly disseminated in collateral tissues of the pelvis, can be destroyed by caustics without enormous mutilation, with concomitant functional, and occasionally trophic, disturbances. And for this reason, if radium will reach these cancer cells, it must ultimately become the remedy of choice.

X-ray I cannot discuss from personal observation.

Radium is phenomenal in its action in many of these cases. Dr. Clark, already quoted, stated that 67 per cent. of the 90 per cent. of inoperable cases were materially helped by it, while 16 per cent. were clinically cured. My own experience, though of less extent, is practically the same. With a single exception, all of my patients have shown marked temporary benefit; and I might add that all the cases that have been referred to me were advanced hopeless ones. In the one case referred to, pain was not at all relieved.

Radium can also be of great value as a prophylactic adjunct to surgery, *x*-ray and caustics in these cases. It is easy of application, devoid of pain, does not mutilate, and from our present knowledge of the technic, free from danger.

It is unfortunate, after these experiences, that the therapeutic value of radium, used in conjunction with surgery or as a palliative measure, should be questioned or condemned in the slightest degree, or that the cancer victim should be denied its benefits, because the skeptic argues that metastasis (which has already occurred) is not relieved; or because the hopeless case does not live for five years.

The way in which radium acts on cancerous tissues is interesting. Maloine, of Paris states: "The radium rays, acting on neoplasms, cause a retardation of cell growth, a destruction of the cells, and in some malignant cells a change which leads to the cell becoming normal."

Henry Schmitz, of Chicago, has proven by pathological specimens from a large number of cases in his own clinic, as he reported at the meeting of the American Radium Society in June, 1917, that in cancer of the cervix uteri changes commence almost immediately after the radium has been applied; and that in a brief period the cancer cells have been generally destroyed. The changes consist in an immediate degeneration of the cancer cells, thereby causing a cessation of mitosis. This traumatic action is followed by a leukocytic and lymphocytic infiltration, resulting in connective-tissue formation.

Clinicians and physicists concede this action of the gamma rays to be possible only at a distance of from 3 to 5 cm. from the point of application, and say that beyond this distance the rays may stimulate the growth. I believe that either the individual infection, or peculiar resistance of the tissues, or both, may prove in the future to be a factor in this connection. To justify this conclusion, I will briefly report two cases.

Miss S., aged fifty-one, seen at the Saratoga Hospital through the courtesy of Dr. Humphrey. Present condition extremely emaciated, septic, bed-ridden, not able to walk or stand; complete procidentia. The uterus, 4 by 6 inches; the cervix everted so that it had the appearance of a large cauliflower 5 inches in diameter, with a very foul odor, practically making the ward unendurable for others. Radium element was applied four times at intervals of ten days. The entire condition cleared up as if by magic, the odor and discharge disappeared, and the growth melted away. The cervix assumed its original contour, though somewhat enlarged, and the body of the uterus diminished in size and receded to its normal position in the pelvis.

Mrs. L. D., West Indian negress, aged forty-six. Referred by Dr. Thompson, who gave the following history: First noticed mass in abdomen six years ago, it was accompanied with a clear mucous-like discharge and some pain. The tumor became continually larger, pain more severe, and discharge very offensive. When I first saw her, April 7, 1917, she was emaciated to the last degree and septic, with a fixed growth in the abdomen extending to the ensiform, laterally filling the entire abdomen. Vaginal examination showed all the pelvic tissues indurated and board-like, with a large rectovaginal fistula. She had a very profuse vaginal discharge, mixed with blood, the odor from which was so unbearable that we could not have her in the ward with other patients. Notwithstanding that she was in a semiconscious condition, I was anxious to try radium, and the staff acquiesced. Seventy-five milligrams of radium were applied, placing it tandem in a rubber tube, halfway into the rectum through the rectovaginal fistula. She remained in about the same condition for a week, at the end of which time she commenced to improve and became conscious. At the end of six weeks there was an improvement which was unmistakable and which has continued to the present time. The diagnosis was a fibroid undergoing malignant degeneration. On September 1st she came to the hospital for a treatment and actually walked from the conveyance to the elevator, and then from the elevator to the ward. The odor is practically gone, and the discharge has markedly diminished. The growth now seems about 4 inches in diameter in the region of the right ovary and uterus, and is movable. The induration is gone, except in the rectovaginal septum, about the fistula. The patient seems cheerful and happy and believes she is going to get well.

Thus, it would appear that the gamma rays were effective in the first case at a distance of 12 to 15 cm.; while in the second case the distance was about 30 cm. There was no cross-firing in either instance.

In closing, I am certain that the skeptical practitioner is only to be convinced of the action of radium as an alleviating measure, by personal observation. Yet if we tell the story over and over again, the seed may occasionally fall on fertile ground, and some poor sufferer be given hope and comfort. I can think of no source from which such information might better come, or of no body of men more fitted to inspire confidence in a therapeutic measure of this sort, than our own Society, and I contend that we might well make such an effort.

MIXED CELL TUMOR OF THE KIDNEY WEIGHING THREE POUNDS IN AN INFANT TEN MONTHS OLD.*

BY

WM. EDGAR DARNALL, A. M., M. D., F. A. C. S.,
Atlantic City, N. J.

(With four illustrations.)

THE case herewith reported was referred to me with the following history. I. M. S., an anemic, girl baby of ten months. Her family history is negative, revealing no tuberculosis, malignancy, or kidney troubles. The child had a normal birth, but has always been delicate and, according to her mother, has had a bronchitis since birth. At six months of age the mother first noticed an enlargement of the right side of the baby's abdomen. This progressively increased in size until it filled almost the entire cavity. The pressure of the tumor mass upward was so great as to partially impede the heart action, and the child was unable to properly expand its lungs. An examination of the chest showed numerous mucous râles, which I ascribed to imperfect aeration since, as soon as the tumor was removed and she could take long breaths, they disappeared.

There was some doubt in our minds as to whether the tumor mass was an enlarged spleen or kidney. It was easily palpable and outlined without difficulty. The contents of the abdomen were pushed over to the right side by the tumor.

The blood analysis showed an anemia; red cells, 3,280,000; white cells, 11,600; hemoglobin; 58 per cent.; lymphocytes, 26 per cent.; large mononuclear, 1 per cent.; polymorphonuclears, 73 per cent.; transitionals, 1 per cent. Repeated examinations continued to show about the same relations and definitely excluded splenic disease. The *x*-ray examination was unsatisfactory and was of little value.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

An attempt to get a functional test with phenolphthalein was unsatisfactory, because the patient was so restless that a catheter could not be kept in the bladder for the necessary time, and, like all small children, she could not hold her urine and frequently passed it. A catheterized specimen, however, showed an acid reaction, slightly flocculent sediment, large amount of albumin, no sugar. Microscopically, some triple phosphate crystals, epithelial cells, a few white blood cells, red blood cells, hyaline and granular casts.

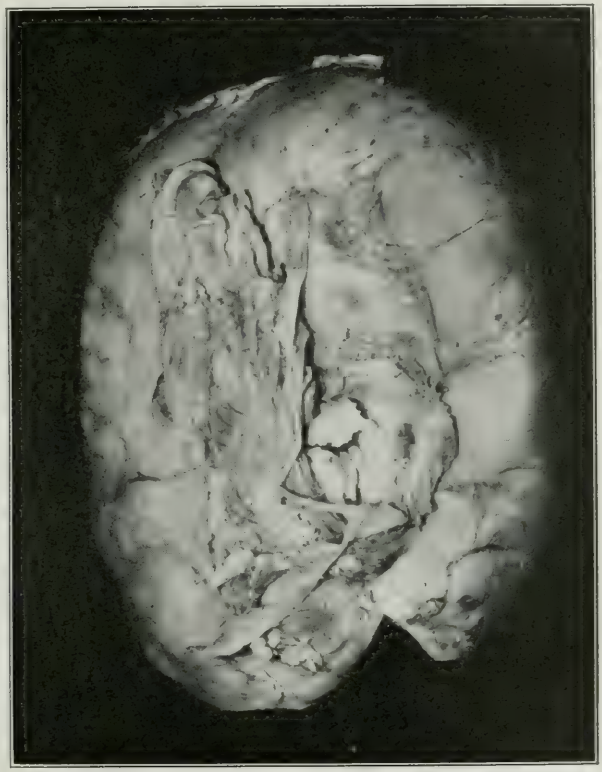

FIG. 1.

The baby up to the day of the operation was breast fed by the mother, but in the usual unsystematic and desultory fashion, that is, whenever it cried. It was decided to operate on the left kidney. Up to this time we did not know whether we would find a polycystic kidney, a sarcoma, or some other form of tumor. Operation was done Dec. 29, 1916, through the usual curved incision. The tumor was of such size that the incision was extended down over the abdomen to a point opposite the crest of the ilium. Ether was administered very carefully, but as the tumor was lifted from its bed there was a decided collapse, which necessitated stimulation. The tumor, however, was quickly removed, taking in all about twelve minutes. There was almost no hemorrhage. Especial care was given to hemostasis, since we know that young children stand hemorrhage very badly, and many of the unfortunate results of surgery in the very young are due to the loss of blood. Although the operation was a clean one, a small cigarette drain was placed in the wound on account of the large cavity left, so that the serous oozing from it would drain away.

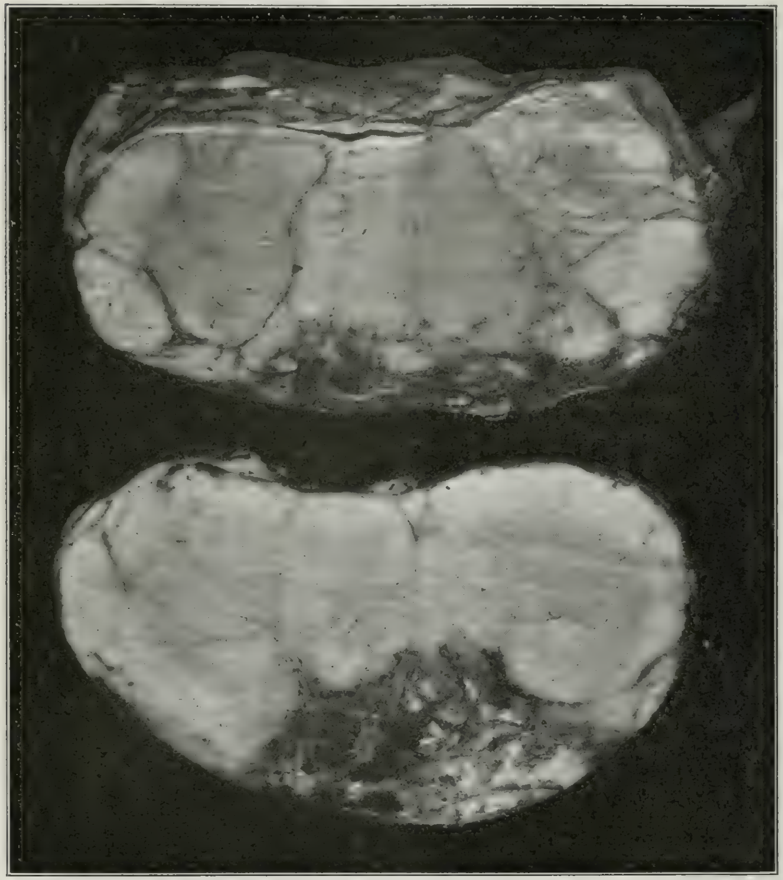

FIG. 2.

There was a sharp rise of temperature to 104° F. the day after the operation. This quickly came down to normal in about thirty-six hours, and the temperature and pulse pursued a normal course from then on till she was well. The other kidney functionated well. The patient was given a milk formula and her feeding carefully watched. She began to improve in appearance and strength. The râles in her lungs cleared up and she made a smooth recovery, leaving the hospital in excellent condition. About three and one-half months afterward, however, she died, having all the clinical manifestations of recurrent sarcoma, although no autopsy could be obtained.

The report of the pathologist, Dr. H. T. Harvey, is as follows:

Specimen.—Left kidney with two tumor masses attached. It consists of a large mass of tissue resembling a kidney. There is a small mass adhering to it which breaks down easily and has the appearance macroscopically of carcinoma. The larger mass measures 15 × 8 centimeters; the smaller 5 × 5 × 4. The entire mass weighs 1120 grams or about 2¾ pounds. The large mass is covered with a capsule which is firmly adherent. It is reddish white in color, and one section reveals a soft white mass at the upper portion of the specimen. The white mass cuts with slight resistance and has a slightly granular surface. The smaller mass is very hard and firm. It is white in color and cuts with marked resistance, but the inner portion is quite soft and flabby. Microscopically only a small amount of renal tissue is seen. The greater part of the

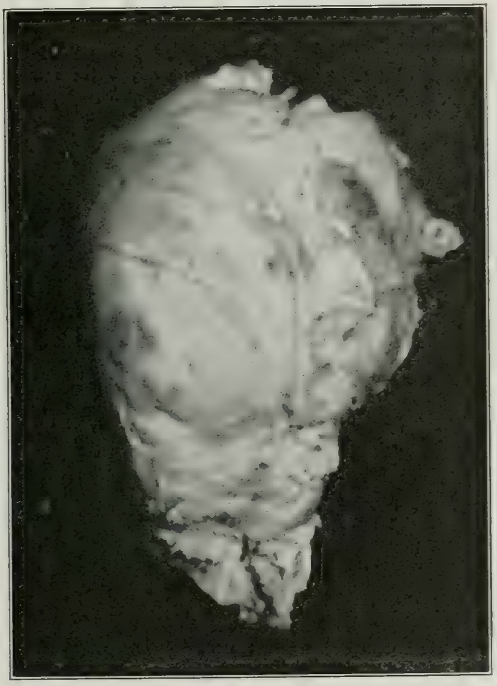

FIG. 3.

tissue is composed of cells resembling those seen in the adrenal gland (spongiocytes). The section is quite vascular. Diagnosis. Hypernephroma.

Dr. Joseph C. Bloodgood, of Baltimore, who was present when the tumor was exhibited, was so much interested in it that he asked to study its pathology. I accordingly sent it to him, and am much gratified to be able to append his valued report as follows:

Microscopic Study: Section I.—Tumor and capsule from homogeneous opaque granular area. Capsule shows in the first place, kidney tissue, a zone of eosin fibrous tissue, and then the tumor. The kidney tissue shows nothing abnormal except compression. The tumor is composed of many different types. In the first place, there are sections of cells which suggest tubules of glands. Around these cells there are loose tumor cells somewhat of the type of lymphosarcoma, and then these masses of cells are rather indefinitely separated by small spindle cells. We have, therefore, the appearance of a tumor containing remains of granular tissue which has become malignant. Apparently some of these spindle cells separating to tubules and the cellular areas are smooth muscle. The tumor cells about the section of the tubules resemble in their morphology sarcoma rather than carcinoma.

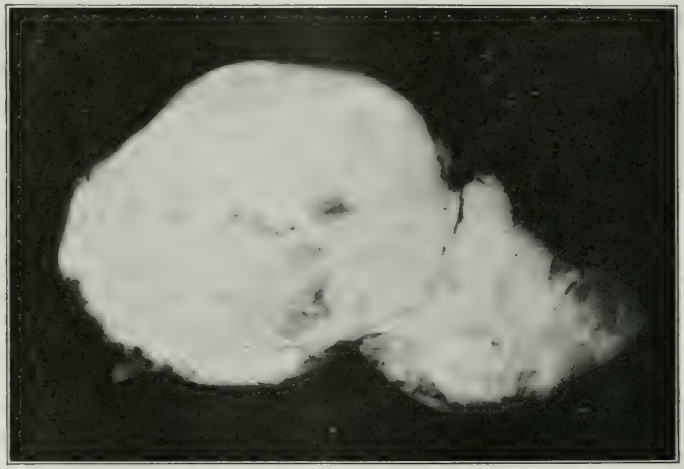

FIG. 4.

Section II.—Hemorrhagic Area. In this section the majority of the tissue takes only the eosin stain without cells, but we see a zone of this hemorrhage tissue composed of the capsule of the tumor, with no kidney substance, and beneath this a narrow zone of tumor tissue. The sections of tubules here show slight distention and appear as small epithelial-lined cysts. About these tubules we see many spindle cells resembling smooth muscle, and some of the very cellular areas resembling sarcoma, as in the previous section.

Section III.—Is from small separate tumor which in the gross looked more like a myoma. This tumor is composed of longitudinal and cross-section of smooth muscle, separated in places by an unsustaining intermuscular substance, but here and there we can see the beginning of cellular areas like sarcoma, but in this tumor we see no tubules.

Section IV.—From portion that suggested remains of kidney. This is more or less normal, but slightly compressed kidney tissue.

The impression that I get is that we have originally here a congenital tumor of the kidney, a leiomyoma which has become sarcoma. In remains of tubules in the tumor the tissue may be congenital remains of one of the embryonic kidneys, or may be remains of the normal adult kidney infiltrated by tumor.

I cannot make out any fully developed striated muscle; all seems to be smooth muscle.

These tumors are considered malignant, but may be benign. Whether they are to be classed with carcinomas or sarcomas, seems to be a question pathologists have never definitely decided.

Metastases are late but eventually occur. The adrenal tumor may arise from adrenal rests in ectopic portions of kidney, ovary, testicle, liver, mesentery, lungs or bones.

A review of the current literature of the reports of tumors similar to this one shows a hopeless failure to arrive at any adequate classification. Until the etiology is more definitely known, no classification will be satisfactory. As a matter of fact, these tumors are always made up of "mixed" cells. Each pathologist seemes to have named the type of tumor according to the tissue cells he may have observed in the microscopic examination. The same pathologist will no doubt find many varying types of cells in different portions of the same tumor, and it is therefore necessary to examine every part of the tumor or some of its elements will be overlooked. The term hypernephroma has, for convenience sake, been applied to them, but hypernephroma may mean almost anything that is a kidney tumor.

In a careful study by A. C. Wood(1) the literature and pathology have been reviewed, and I shall take the liberty of quoting freely from that article which presents the matter in concise form.

"Accessory adrenals composed of cortical tissue may occur in the adrenal tissue or its capsule, or even in the kidney. When these hypertrophy, an adenomatous type of growth results. These tumors show the typical cortical tissue with columns of cells in a meshwork of capillaries. They may occasionally reach large proportions. On the other hand, there are tumors which in certain parts resemble the preceding, while in other parts are cells of smaller size, less deeply stained, and containing less fat, with transitions from adenoma to sarcoma, and even with the presence of definite sarcomatous tissue. The metastases are clearly sarcoma. These tumors have been called homotopic hypernephroma in contradistinction to the Grawitzian type, which is heterotopic hypernephroma. There is at this time no agreement of opinion in regard to the real nature of these tumors. For instance, some may arise in the kidney cortex, quite independently of any adrenal displacement, hence a true nephroma. The cortex of the kidney and that of the adrenal are closely related embryologically, so that tumors of these structures might be expected to possess closely related connections. These tumors are usually vascular. The cells are in close contact with the capillaries. They are prone to hemorrhage. Metastases by the blood current are common, and the tumor tends to grow along the veins to the vena cava."

In 1894, Birch-Hirschfeld pointed out that the infantile tumors of the kidney are identical in character and origin, and differ only in the proportions of the various elements present, of which two are especially typical (glandular tubes and undifferentiated embryonal cells). He called attention to the resemblance of these tumors to the early Wolffian body, and concluded that they originate in rests of this structure, which have become included in the kidney during its development, just as a portion of suprarenal gland may become displaced. He proposed the name "embryonal adenosarcoma."

Maas held the opinion that these tumors develop from rests of the early fetal kidney, on account of the similarity of their structure to this body. Wilms advanced the theory that these tumors are a development from common mother cells of myxoma-like tissue, which, he believed, represent mesodermal cells in a very early stage of the embryo. These would normally later develop into pronephron and myotome. When, from some cause, these cells lose their normal connections, they remain for a certain length of time as so-called rests, and subsequently take on rapid growth, producing a tumor composed of the various types of tissues which would have formed if they had maintained their normal relations. At the stage indicated, all the elements found in these tumors are in close proximity, and the various degrees of displacement of portions of these elements account for the variations observed in the tumors.

It thus happens that some of the cells develop along the lines of the Wolffian body, while others form muscle, cartilage, bone, etc.

Adami and McCrae explain certain forms of these tumors as follows: "The distal collecting portion of the renal tubules are derived from the Wolffian duct and the glomerular epithelium and main part of the tubule from the mesenchyme. As the primitive kidney is intimately associated with the Wolffian duct, tumors arising in these structures also involve the germinal mesothelium. It follows, therefore, that while pure adenomas are met with which show no evidences of reversion, various transitional tumors occur which in parts show the structure of adenoma and in other parts of sarcoma. In other areas one passes insensibly into the other."

Clinically, Wood thinks that the suggestion of Bendell that these renal growths occurring in infants be called "mixed tumors of embryonal origin" is, in the light of our present knowledge, satisfactory.

While etomologists may differ as to the origin and pathologists as to the classification of these tumors, they all clinically run a similar course, namely, they occur early in life, they grow rapidly without causing pain until late, and they invariably end fatally unless relieved by operation."

The immediate mortality is high, but with improved technic it is being lowered. Recurrences are said to take place in from 70 to 80 per cent. of the cases.

Early diagnosis and operation are the only hope of saving more of these cases. A large percentage of them develop metastases and die. Some, however, have remained well after the removal of the tumor. More favorable results might be obtained, no doubt, if the cases could be discovered and operated upon earlier.

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1704 Pacific Avenue.

ETIOLOGIC STUDY OF VULVAR CARCINOMA.*

BY

FRED J. TAUSSIG, M. D., F. A. C. S.,
St. Louis, Mo.

(With twelve illustrations.)

WHEN we consider the frequent traumatisms to which the external female genitals are subjected to at childbirth and through intercourse, the extreme rarity of cancer of the vulva can only be explained on the basis of a considerable natural resistance of these parts to malignant degeneration. Cancer of the vulva occurs but once to about twenty cases of cancer of cervix. Nevertheless, partly owing to its superficial development, partly because of special irritative factors, it presents opportunity for the most interesting etiologic studies in the domain of gynecological tumors.

The fifteen cases upon which this paper is based were observed, with but one exception, at the Barnard Free Skin and Cancer Hospital, in the services of Dr. Gellhorn and myself. Cases VI, VII, and VIII in the series were operated on by Dr. Gellhorn and with his consent have been included in the present investigations. In all instances sufficient tissue was removed for microscopic diagnosis but in cases I, VI, XI, XII, XIV and XV, the slides and blocks of tissue saved for examination did not permit of any detailed histopathologic examination. There remained, therefore, nine cases that were studied in detail. In them several blocks were taken from different portions of the tumor, glands and surrounding vulvar skin and stained with the various specific skin stains (hemotoxylin-eosin, Weigert picro-carmine, acid orcein, neutral orcein, glycerine ether-polychrome, methylene blue, and collagen). By a careful anamnesis together with a consideration of the gross and minute pathology we were able in all but two instances to arrive at a plausible explanation of the etiology of these cases. I realize the difficulty of proving such etiologic relationship conclusively but in most instances the evidence was fairly convincing.

More than any other form of genital cancer in women, that of the vulva is a disease characteristic of old age. Rothschild who gave, in 1912, a very complete analysis of 331 cases of vulvar carcinoma reported in literature, found the following distribution as to age:

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* Read at meeting of the American Gynecological Society, Pittsburgh, May 31, 1917.

10–20 yr.	21–30	31–40	41–45	46–50	51–55	55–60	61–65	66–70	71–75	76–95
2	9	28	26	34	40	48	50	54	24	16

The greatest frequency, therefore, was in the period between sixty-one and seventy years. In our own series nine out of the fifteen were sixty years or more in age. Exceptionally young was one at twenty-seven and one at thirty-three in our series. It is interesting in this connection to note the relation of age to the etiologic factors in this review.

Etiology.—All but two of the fifteen cases could be placed definitely in one of the following groups according to their etiology:

A, trauma,
B, syphilis,
C, condylomata acuminata,
D, kraurosis,
E, leucoplakia,
F, Paget's disease.

The two unclassified cases were both periurethral cancers. It should be stated that I do not include in my series of vulvar carcinoma six primary urethral cancers that came to our hospital during this same period of time.

Group A.—*Trauma* has, of course, been held responsible for many cases of cancer without due cause. In the two following cases, however, the history was very definite.

Case I.—Mrs. M., seventy-one years, para-vi, menopause at forty-five years, entered the hospital June 17, 1911, stating that one and a quarter years ago she had cut herself with a stiff piece of paper in the perineal region. The injury had been treated by a doctor. It not only would not heal but became worse. At the time I first saw her an ulcer involving both labia minora and majora with some induration of both inguinal glands was discovered. A complete excision of the vulva with its tributary glands was done with good immediate result. Nine months later the patient entered my service at the City Hospital with a local recurrence that was found to involve the pubic bone. A secondary operation was attempted but owing to the weakened condition of the patient and the extent of the bony involvement only palliative measures could be used. Necrosis and separation of pubic symphisis followed. She died one month later. No autopsy. Microscopic examination of the specimen showed a squamous-celled carcinoma without tendency to keratinization. Inguinal glands on both sides showed carcinoma. No sections of vulvar skin saved for examination.

Analysis.—Labial cancer with secondary extension to pubis with a history strongly suggestive of a traumatic origin but without gross or minute pathologic evidence to support this view.

CASE II.—Mrs. De., forty-three years, para-iv, still menstruating regularly. Fell astride a ladder while picking cherries in May, 1916. A bruised spot was noticed at the time on the right labium and this lump remained sensitive. She applied pure carbolic acid to the spot to relieve the soreness several times. Thereupon the lump began to ulcerate and the ulcer has continued to grow larger ever since. When she entered the hospital January 17, 1917, a large papillary mass consisting of several nodules occupied the region of both labia, clitoris and urethra. Vaginal orifice completely surrounded but vagina not directly involved. Inguinal glands especially on right side hard and enlarged. Wasserman + + + +. No history or evidence of lues except the Wasserman reaction. Piece of tumor examined microscopically and found to be a medullary squamous-celled carcinoma. Two-stage operation decided on owing to extent of local lesion. Double inguinal adenectomy with removal of deep glands after incision of Poupart's ligament according to Basset. Two weeks later, February 5th, the tumor, including urethra and entire vulva was excised by electrocautery. Only 3–4 silkworm-gut tension sutures used to approximate tissues. Wound allowed to heal under open air and dry heat treatment. Unusually rapid granulation. Partial urinary incontinence. Attempt at urethral plastic unsuccessful. Active antiluetic treatment. No recurrence at time she left hospital in May, 1917.

The specimen showed a large nodular tumor, undermining the skin edges, as if its origin might have been the deeper tissues. There were no pearls or evidence of keratinization and in portions a glandular structure suggested Bartholin's gland as the point of origin. The vulvar skin seemed perfectly normal, showing nowhere transitions suggestive of any connection with the tumor. No white or pigmented areas.

Analysis.—A positive history of trauma associated with a deep bruised lump in the region of Bartholin's gland, that proved later to be malignant. No history of a previous syphilitic ulcer from which the tumor could have sprung but the still active syphilis may have been a predisposing factor in her carcinoma.

Group B.—Syphilis is probably only in a few instances an etiologic factor in carcinoma of the vulva, for I agree with the vast majority in believing leucoplakia of the vulva as in no ways a manifestation of lues. It is not to be compared in that respect with buccal leucoplakia. Three negative Wassermans out of five were reported in my series. Nevertheless, in the following case I think there can be very little doubt of the close relationship between carcinoma and lues.

Case III.—Mrs. B., twenty-seven years, nullipara, had acquired lues at the age of twenty-two. Both tubes and ovaries were removed for gonorrhea three months ago. No menstruation since. Two doses of salvarsan in the two previous years. Came to the hospital May 6, 1912, on account of a free vaginal discharge, partial incontinence of feces and irritation about the external genitals. Examination showed Wasserman ++, old luetic scars over body, labia minora and majora indurated and edematous, small rectovaginal fistula, surrounded by induration, stricture of rectum, anal tags, urethral induration, in fact the typical picture of tertiary lues of the vulva. Only at the margin of the induration under the left labium minus the ulceration showed a more papillary character. Although considering the diagnosis of cancer as improbable, a piece was excised for microscopic examination May 24th. It showed "epithelial proliferation but no distinct evidence as yet of malignancy." The absence of response to treatment led to a second excision on June 20th, with positive evidence of a beginning cancer. A vulvectomy was done June 27th and the patient left the hospital August 13th apparently well. On September 18th she reentered with symptoms of urinary incontinence and bloody discharge. Examination showed a typical carcinomatous mass involving the entire urethra, the remnent of the right labium majus and the upper vagina. The patient was markedly anemic. Only palliative measures were employed. Patient died in the hospital November 1st with pronounced local extension. No autopsy secured.

Analysis.—An early but extremely malignant carcinoma developing from the edge of a typical syphilitic gumma in a very young woman with artificial menopause.

Group C.—*Warts* have been held to be an etiologic factor in a number of vulvar cancers by von Winckel and others. In the following case the association between the two was very close.

Case IV.—Mrs. B., thirty-three years, para-ii, gave a history of gonorrheal warts, condyloma acuminata, that appeared for the first time ten years ago. They were removed by cautery two years later. In the course of the following two years the warts again returned and had been present ever since. About three years ago the patient had a panhysterectomy done for uterine fibroids. Since that time no menstruation. Soreness about external genitals in the last few months. She came to the clinic November 6, 1916, because of a painful swelling in the right inguinal region beginning suddenly one week previously. On later questioning she stated that a small kernel had been noticed in that region for several months.

Examination showed a vulva covered with condylomata acuminata with an indurated ulcer in the region of the clitoris (Fig. 1). In the inguinal region was a typical bubo. Patient's temperature 101°. The ulcer was naturally interpreted as a chancroid. No suspicion of cancer entered my mind. On the following day my associate, Dr. Kate Spain, opened the abscess and reported that a purulent but somewhat grumous material had escaped. The periadenitis persisted, however, and during the following week a cauliflower mass began to fill the cavity and proliferate over the skin edges (Fig. 2). A section was removed for diagnosis but before the report came back, the diagnosis was self-evident. The inguinal glands on the opposite side also enlarged with startling rapidity. The indurated ulcer of the clitoris, not larger than a quarter proved to be the primary tumor.

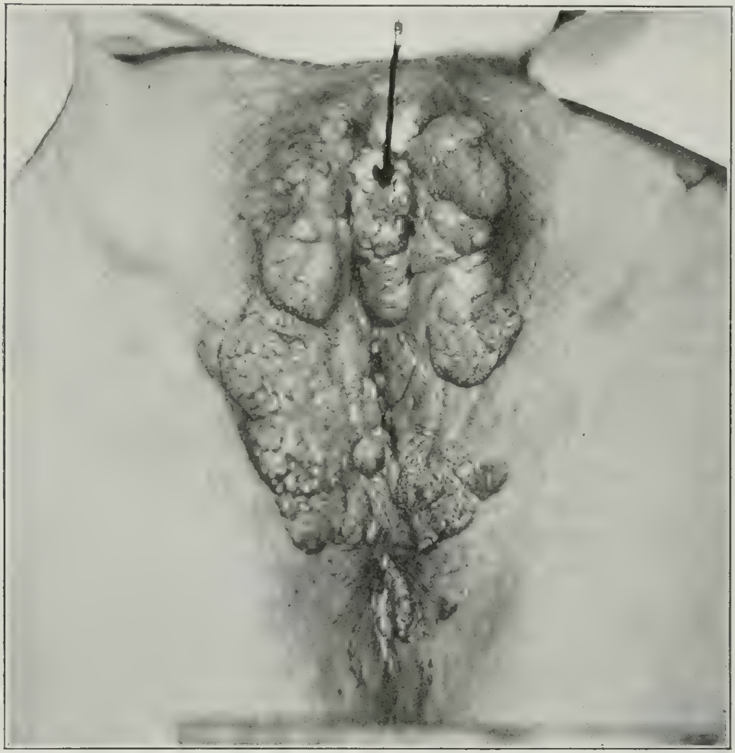

FIG. 1.—Primary carcinoma of clitoris developing on a basis of condylomata acuminata.

Deep *x*-ray therapy only seemed to excite the growth. Realizing fully the slight chance for permanent relief an attempt was made to remove all the involved lymphatics that could be reached through the double inguinal incision together with the upper half of the vulva. This was done December 15th. The immediate result gave the patient much relief from pain and necrotic discharge. Two months later a recurrence in the right femoral ring was observed. Extreme doses of *x*-ray with the Coolidge tube over the open wound, only melted away the superficial portions of the tumor. The patient died March

6, 1917, just about five months after the onset of her first definite symptoms.

Pathologic examination of the operative specimen showed enlarged lymph glands varying in size from an almond to a lemon, consisting almost entirely of cancerous material. The vulvar skin was apparently normal except where it was covered with typical benign condylomata acuminata. One of these condylomata was situated at the edge of the ulcerated clitoris and as seen in the accompanying micro-photographs (Figs. 3–4) the carcinoma developed right at the base of this condyloma.

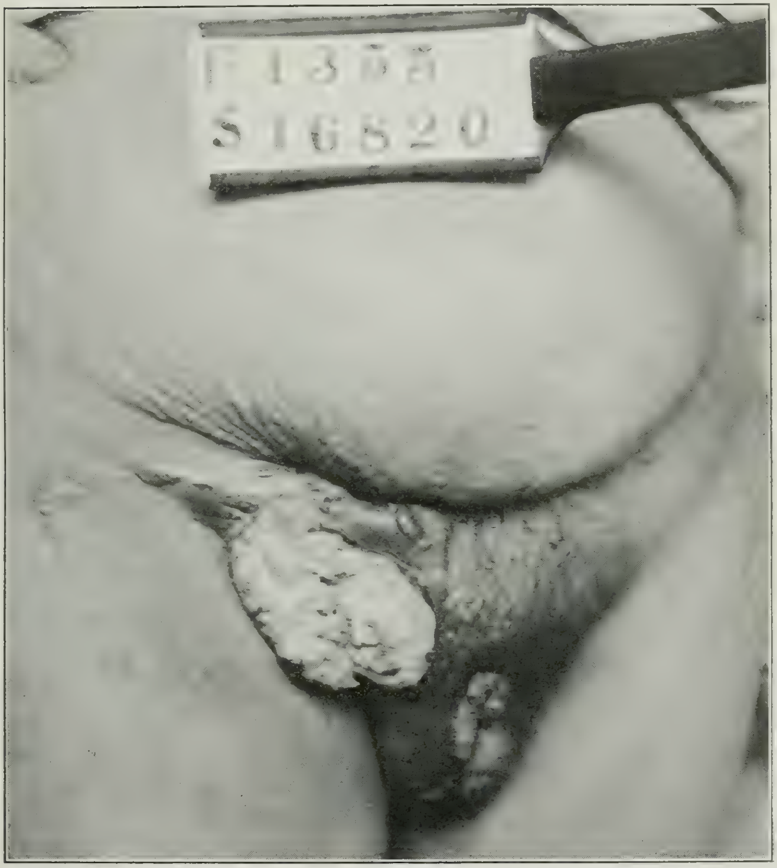

Fig. 2.—Carcinoma of inguinal lymph glands secondary to carcinoma of clitoris.

Analysis.—As in case III we have here again a young woman with artificial menopause. The cancer developed on a base of acuminate warts and spread rapidly with marked glandular involvement and fatal result.

Group D.—Kraurosis was found to be the basis for cancer in four of our cases.

Case V.—Miss Ko., sixty years, single, menopause at forty-nine, stated on admission July 24, 1914, that she had had a severe pruritus vulvæ for five years. One year previously the condition had been diagnosed as a skin cancer and only the tumor itself excised. The itching persisted and in May a small ulcer was noticed in the region of the fourchette. This typical epithelioma was the size of a half-dollar, situated over the perineum at the time she first consulted us. The remaining vulva was white, glistening, parchment-like, with obliteration of the labial folds. Vagina stenotic. Inguinal glands show numerous hard enlargements, size of a bean. Complete excision of the vulva with tributary lymphatics was done July 27th. Glands on right side showed carcinoma. Prophylactic x-ray given. Recurrence in right femoral ring in the following August, 1915. This

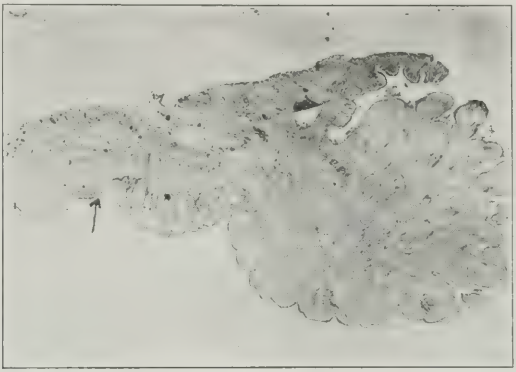

Fig. 3.—Cross-section of acuminate wart with carcinomatous change at point of arrow. Higher power in Fig. 4.

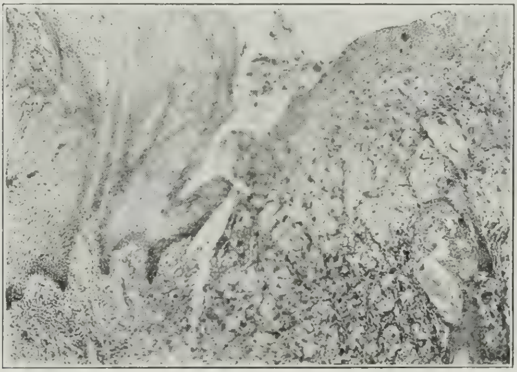

Fig. 4.—High power photo-micrograph of point of contact between the accuminate wart (left) and the carcinoma of the clitoris (right).

gland was dissected out as well as possible though partly adherent to the large vessels. Again x-ray therapy. No local recurrence. Induration in right femoral region returned in December and patient died suddenly through a perforation of the femoral artery on January 27, 1916.

Analysis.—A fairly benign case, badly treated by inadequate surgery at the start, developing on a kraurotic vulva after five years of irritation.

CASE VI.—Miss S., seventy-five, single, entered hospital March 8, 1911, with a history of intense burning in vulva for three years. Obliteration of clitoris and labia minora. Labia majora atrophic. Introitus barely admits a finger tip. Over left labium a slightly raised indurated ulcer. Inguinal glands palpable but not enlarged. Excision of vulva without glands March 26, 1911. Microscopic section shows ulcer to be an epithelioma. Specimen was misplaced and could not be used for a more detailed study. Patient free of recurrence for two years but since then could not be traced.

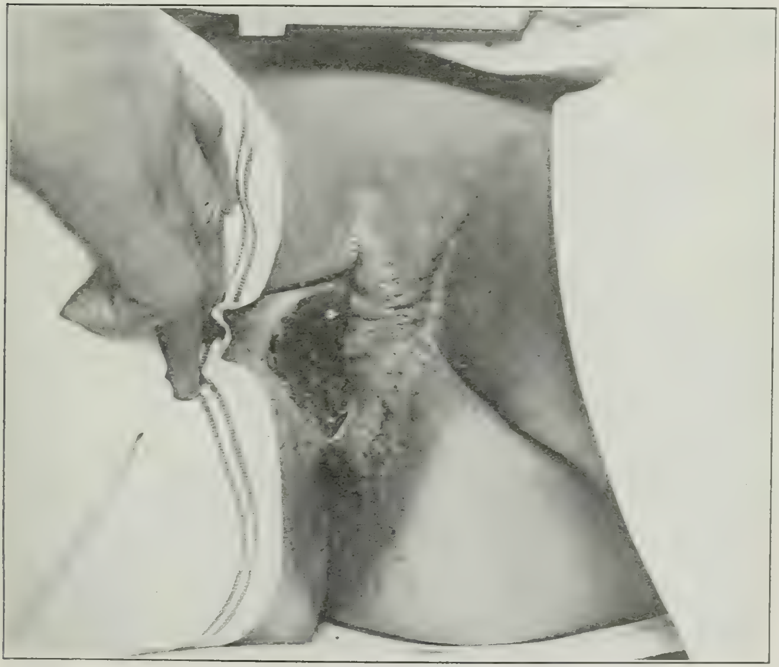

FIG. 5.—Epithelioma of vulva developing on a kraurotic base.

Analysis.—A very early epithelioma developing on a kraurotic vulva.

CASE VII.—Mrs. D., sixty-five, nullipara, menopause at forty-one, entered hospital January 13, 1916, with the statement that for many years she had had an itching of the genitals. Seven months ago a red spot appeared on her right labium as a result of scratching and this spot did not heal as usual. A lump began to form and a watery blood-tinged discharge noticed. Two months ago she saw a doctor who told her the trouble was "suspicious of cancer."

Examination showed as seen in Fig. 5, a kraurotic vulva with typical glistening white skin having a flat epithelioma upon the inner aspect of the right labium 7 × 3.5 cm. in length with raised well-defined edges. February 1, 1916, a vulvectomy was done with removal of glands. Glands not found involved. Examination of patient on April 10, 1917, showed no recurrence of cancer but a moderate recurrence of the kraurosis with some itching.

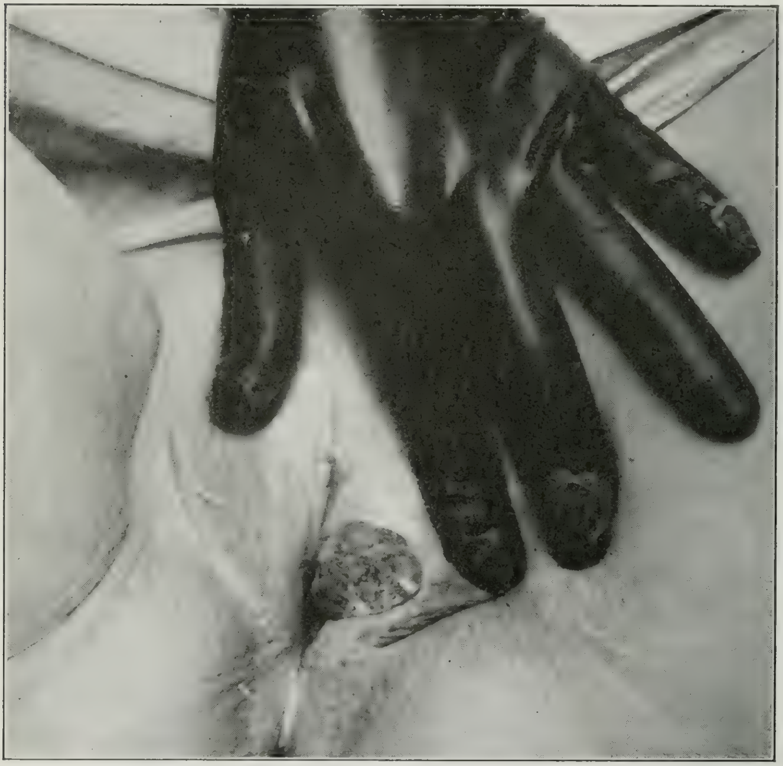

Fig. 6.—Epithelioma of vulva (everting type) developing on a kraurosis vulvæ.

Analysis.—Typical epithelioma on a kraurotic basis with slight recurrence of kraurosis but no further malignancy.

Case VIII.—Mrs. T., sixty years, para-ix, declared that ever since menopause twenty-two years ago, she had had some pruritus vulvæ. The itching was pronounced for the last year and a half during which time she noticed a small lump developing on the left labium and a slight bloody discharge. Examination on March 22, 1916, revealed a glistening white vulva with obliterated labia and clitoris. The altered skin extended to the region around the anus in symmetrical fashion. The flat epithelioma on the left labium was the size of half a dollar with distinct raised border (Fig. 6). Vagina not stenotic. Left vulvectomy with radical removal of lymph glands in both groins. Glands not involved. Re-examination on February 27, 1917, showed no recurrence of cancer but typical white kraurosis extending from the mons to the anus. On April 10th condition same with a moderate degree of pruritus. No local or glandular recurrence.

Analysis.—Typical epithelioma on the basis of a white kraurosis with benign course.

Group E.—Leucoplakia is a term used rather ambiguously by both gynecologists and dermatologists. As applied to the vulva I have tried to limit it to those cases characterized rather by whitish plaques than by a general atrophic process involving the entire vulva. Histologically the lesions in leucoplakia are situated in the epidermis while in kraurosis the essential changes are in the dermis.

CASE IX.—Mrs. B., seventy-seven, para-iv, menopause at forty-seven, entered the hospital May 23, 1916, with a history of itching for one year from which there developed a boil that broke and rapidly ulcerated. Foul bloody discharge and pain in wound recently. On examination a tumor the size of an apple was seen involving entire right labium. Clitoris and labia minora atrophic but not obliterated, presenting a large whitish parchment-like patch. Markedly enlarged and hard left inguinal glands. The age and extent of involvement contraindicated operation. Deep *x*-ray therapy without benefit. Died at hospital three months later. Entire vulva removed at autopsy for microscopic study. Inguinal lymph glands cancerous. Leucoplastic area showed pronounced hyperkeratosis and hyperacanthosis.

Analysis.—An advanced epithelioma developing rapidly on a base of leucoplakia.

CASE X.—Miss. H., sixty-six, single, menopause at thirty, entered hospital July 27, 1916, with a history of pruritus and a lump in the right labium for the last one and a half years. After six months the lump began to ulcerate, discharge and bleed. An attempt at removal in February, 1916 failed to give any relief. In spite of poor general condition and extensive involvement of both labia, patient was operated August 4th with typical vulvectomy and adenectomy. After a fairly good recovery from the operation, she died suddenly seven days later of renal insufficiency. No autopsy was allowed. Inguinal glands on both sides showed involvement. The vulvar specimen on closer examination showed an area of whitish skin, 2 cm. wide along one side of the tumor and this proved, histologically, to consist of a typical leucoplakia.

Analysis.—Advanced carcinoma with history and pathologic findings strongly suggestive of a preceding leucoplakia.

CASE XI.—Mrs. M., sixty-five, nullipara, menopause at forty-eight, stated that she had a watery discharge for one and a half years previous to her entrance in the hospital on May 15, 1911. One year ago she had been told by a physician she had a cancer. Recently some pain in vulvar region. On examination an ulcerating mass the size of a lemon involving clitoris and left labium majus with an area of whitish glistening skin extending for a distance of 1 inch from the margin of the tumor leftwards. Glands apparently involved in inguinal region. Attempt at palliative removal of vulvar tumor in spite of pronounced cachexia. Patient died of shock forty-eight hours later. Typical soft squamous-celled carcinoma histologically. Sections of vulvar skin and inguinal specimen no longer available for present study.

Analysis.—To judge from the gross appearance, the basis of this carcinoma was an area of leucoplakia. No histologic proof.

CASE XII.—Mrs. B., private, thirty-seven years, para-ii, still menstruating, had had severe vulvar itching for about four years. During the last month a small ulcer developed at the point of itching on the right side, bleeding on rubbing. Local applications gave no relief. She consulted me Sept. 14, 1907. I found the left side of the vulva and clitoris absolutely normal in appearance. In the right interlabial region was an area of skin about 5 cm. square, whitish in color, glistening, parchment like in consistency. In its center lay a small papillary growth 2 cm. in diameter that was friable and bled on touching. A bit of the growth removed for examination showed an epithelioma. The patient refused surgical intervention and could not be followed up.

Analysis.—Clinically clearly a case of epithelioma on the basis of leucoplakia but no histologic proof.

Group F.—Paget's disease of the vulva has been described by Dubreuilh in 1901 and presents certain close analogies to kraurosis and leucoplakia. If Dubreuilh is correct in the interpretation of his case, I think the following very similar case in my series should also be classified under this head.

CASE XIII.—Mrs. R. K., thirty-five years, para-v, still menstruating, noticed an irritation about the right side of the vulva in the spring of 1914, white blisters with some thickening appeared in this region during the summer months. During the following winter and spring these blisters began to ulcerate more and more and in May, 1915, they began to bleed. Not until Nov. 5, 1915, one and a half years after the onset of symptoms did she come to the hospital. At this time a large indurated ulcer the size of an oyster lay in the region of the right labium majus (Fig. 7). A smaller similar ulcer lay over the clitoris and surface of the left labium minus and introitus was reddened and contained patches of ulceration with islands of whitish skin. Lymph glands only slightly enlarged. Typical vulvectomy and adenectomy on November 12, 1915. Histologically, the left labium showed the desquamation of the superficial layers of epithelium, the disintegration of the lower layers of the epidermis, the leukocytic infiltration, etc., similar to the description of Dubreuilh's case and to the histology of Paget's disease in other parts of the body. The patient's physician reported May 26, 1917, that she was still well and at work. The patient herself has not yet returned for re-examination as requested.

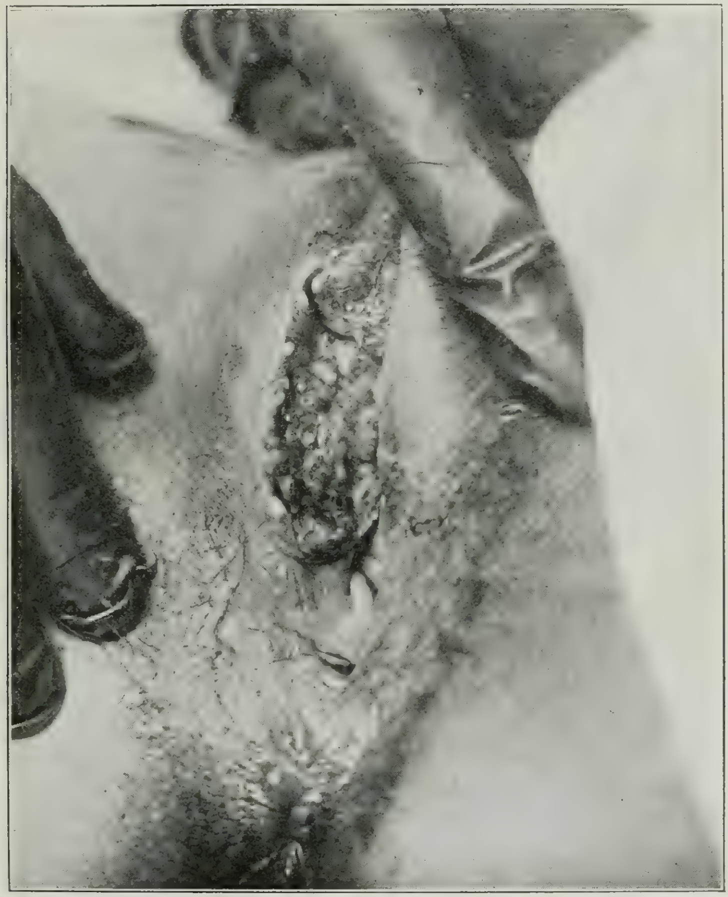

FIG. 7.—Epithelioma of vulva developing from lesions strongly suggesting Paget's disease.

Analysis.—A rather benign epithelioma developing clinically like a case of Paget's disease with histologic findings to correspond.

Group G.—Periurethral cancers of doubtful origin.

CASE XIV.—Mrs. Y., fifty-nine years, entered the hospital April 4, 1911 with an advanced cancer involving clitoris, urethra and vestibulum vaginæ. The symptoms were at first urinary distress and later discharge and burning. Palliative removal of tumor area alone. Local recurrence seven months later involving left pubic periosteum. Pains so severe that the left pubic nerve was resected in the gluteal region for its relief. Partial temporary success. Implantation metastasis in the gluteal incision (Fig. 8.) Death three months later from recurrence.

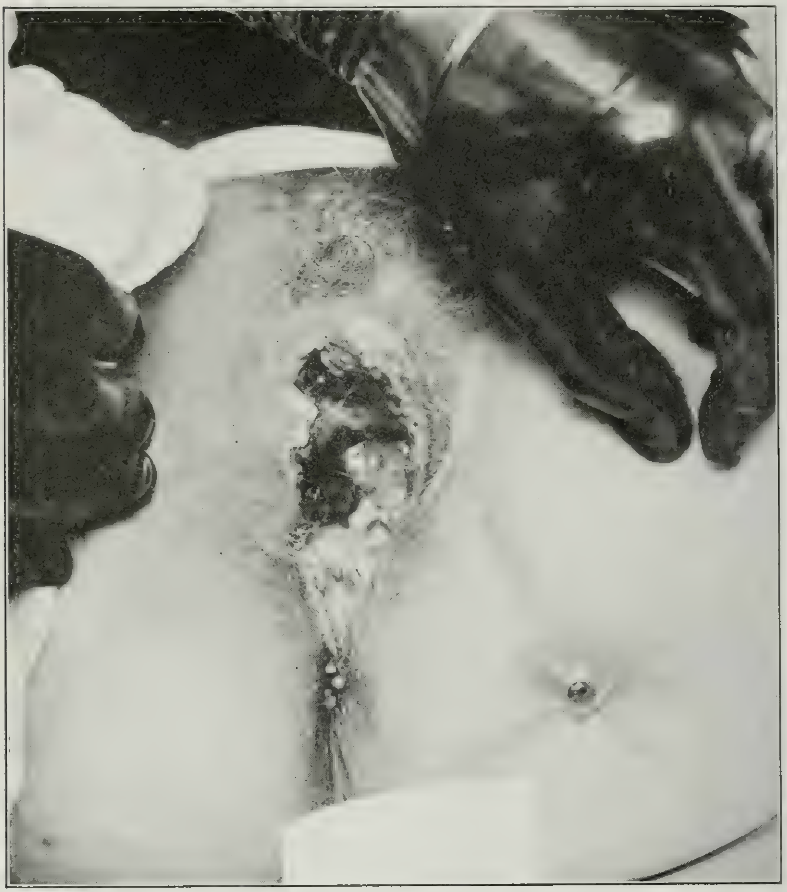

FIG. 8.—Periurethral and vulvar cancer with implantation metastasis in left gluteal region.

CASE XV.—Mrs. A., fifty-five years, para-vi menopause at forty-nine, noticed burning and frequency of urination in November, 1914. Consulted a physician who prescribed medicine without making an examination. Soon a bloody discharge began and grew steadily worse. On admission to the hospital August 21, 1915 a large indurated ulcer involving the left labium minus, urethra and vestibulum vaginæ was to be seen. Deep infiltration to pubic ramus. Lymph glands definitely involved on both sides, especially the left. Excochleation and *x*-ray gave no relief. Patient died December 21, 1915. Autopsy showed extension of cancer up the vagina and bladder and involvement of femoral and inguinal lymph glands. Iliac glands not apparently involved. No metastases in abdomen.

SUMMARY.

These fifteen observations of vulvar cancer again illustrate the great malignancy of cancer in younger individuals. Of special interest was the fact that of the five whose age was under forty-five years, two had had operations that brought on artificial menopause and these two were by far the most malignant in our series. The thought naturally arises whether the ovarian secretions do not perhaps inhibit the development of this form of cancer, particularly since we have seen that over 80 per cent. of vulvar cancers occur in women over forty-five years of age. Previous pregnancies would not seem to be a factor in their development, for six of our fifteen cases had had no children and three of them had never been married. This coincides with Rothschild's statistics.

The comparatively benign course of those cancers that developed upon a kraurotic vulva together with the tendency in these cases to assume the everting rather than the inverting form of growth suggests a greater imperviousness of the tissues in this group to the progress of the disease.

The inguinal or femoral lymph glands were involved with certainty in nine of the fifteen women. Only one of these nine women is at present living and this one was operated on but four months ago so that the probability is that she also will die of a recurrence. The fact that no cancer was found in the lymph glands of some of these cases by no means proves that a small nest of cancer cells was not tucked away in some unexamined portion of the tissue removed. Clinical experience shows that in almost every case of vulvar cancer, even in the earliest stages the lymph glands are involved. Even after radical removal of the lymph glands with the vulvar mass, the chance for a reappearance of the cancer in the glandular system is three times greater than is the local recurrence.

The site of the original tumor in our series was:

Labial fold	7 times
Clitoris	3 times
Bartholin's gland	once
Periurethral	twice
Uncertain	twice

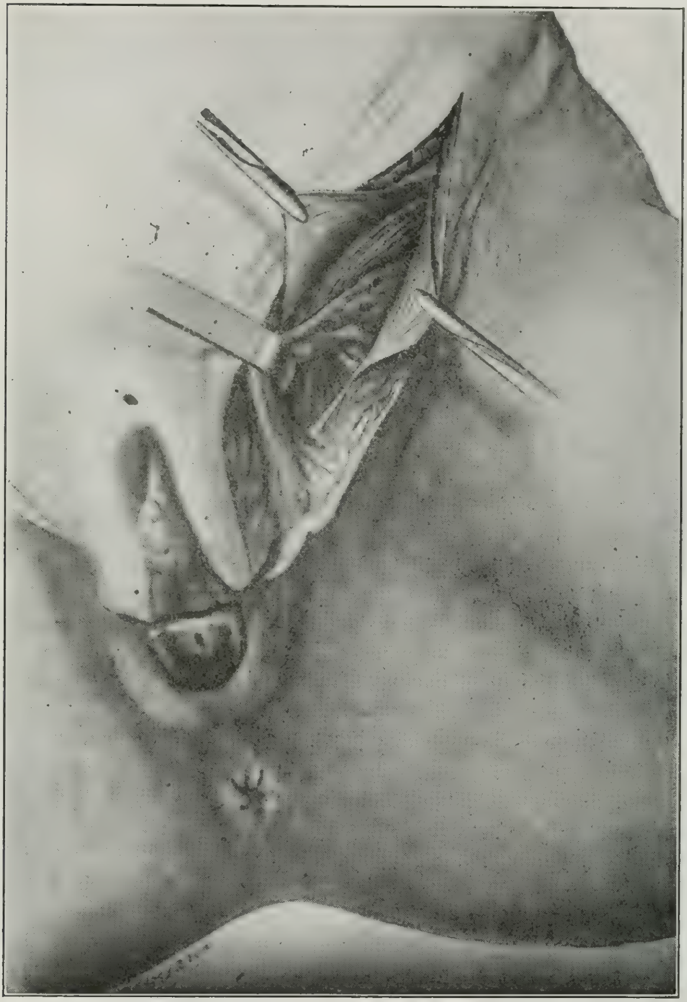

FIG. 9.—Incision opening entire inguinal canal. (*Basset.*)

Those cancers that developed from the labial folds were scirrhus in type and developed slowly. Those that sprang from the clitoris or vestibulum vaginæ were of the soft squamous-celled type and usually far more malignant.

When we consider the fact that these cancers were external lesions usually with pronounced symptoms of irritation and comparatively easy of diagnosis, it is disappointing to find how few patients came to us early in the disease and how few physicians recognized the seriousness of the condition. Both laity and physician are sadly in need of instruction as to the importance of correctly diagnosing all cases of itching of the vulva in women beyond the menopause. If this were done promptly in every case, our results ought to be materially improved. As it was, most of our cases came to us more than one year after the initial appearance of the vulvar growth.

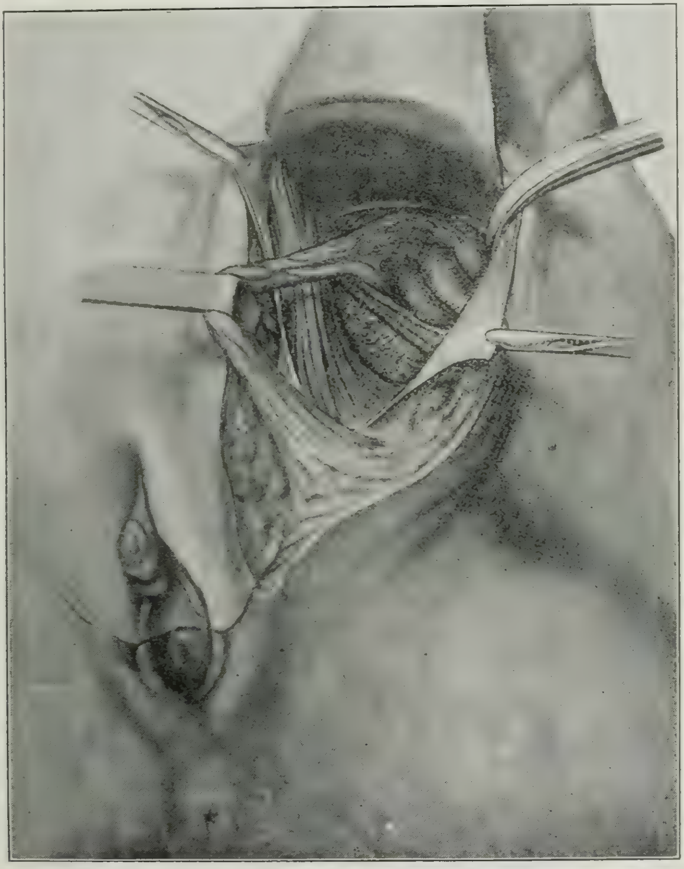

FIG. 10.—Dissection of deep inguinal gland in iliac fossa. (*Basset.*)

Treatment.—Eight of our patients received deep x-ray treatment, four of them with the Coolidge tube, but in none was there more than a very temporary improvement. We had no radium to use but it is difficult to see how its results could have been any better in view of the early and extensive involvement of the lymphatic system in these patients. There remained, therefore, only radical surgical removal as a therapeutic agent.

The large compilations of Rothschild (331 cases) and Basset (146 cases) in recent literature bring out sufficiently clearly the terrible mortality of vulvar carcinoma. It gives a more serious prognosis even than cervical cancer. In fact the number of cases remaining cured after five years is still too small to permit of any definite statement of percentages. The primary operative mortality is, of course, less than after the radical Wertheim hysterectomy but the recurrences are discouragingly frequent.

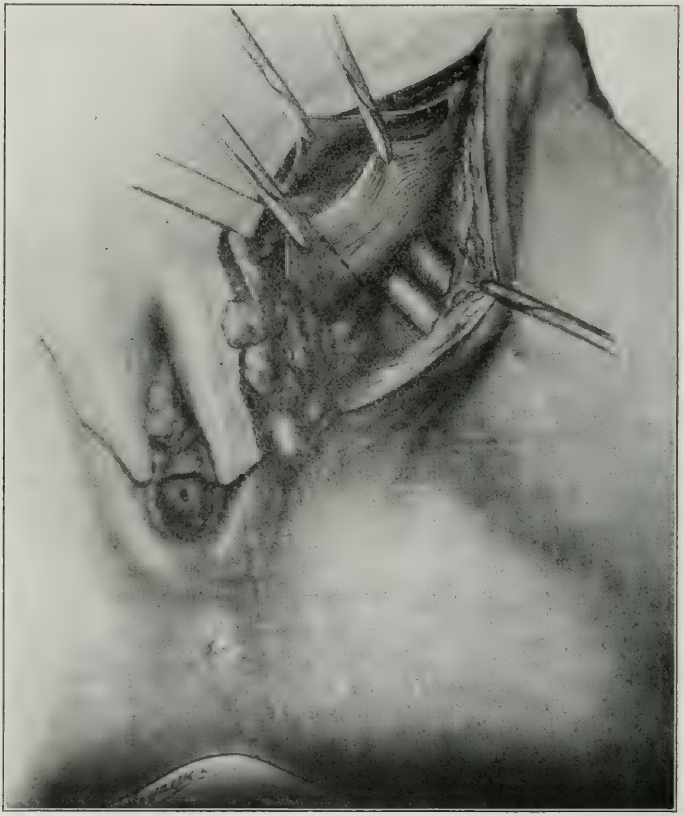

FIG. 11.—Dissection of femoral gland. Dotted line marks line of incision through Poupart's ligament. (*Basset.*)

It is difficult to work out a definite style of operation for a condition that is encountered so rarely as cancer of the vulva. However, through various untoward results such as frequent glandular recurrences in the femoral ring, extensive postoperative necrosis of the vulva, inguinal infections, local implantation metastases, etc., I have recently adopted the following two-stage operative technic:

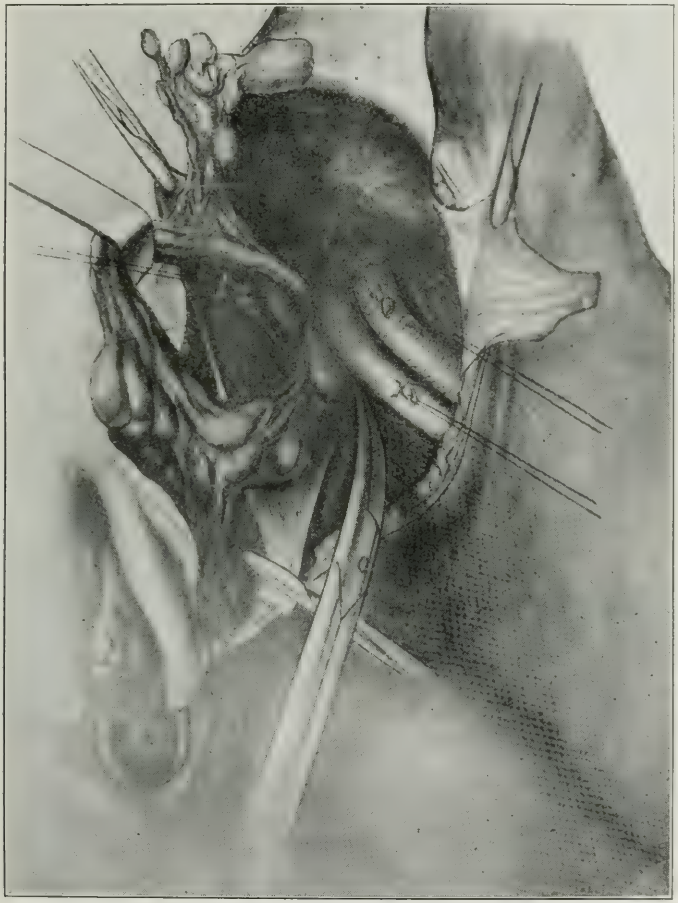

FIG. 12.—Femoral ring opened and deep inguinal and femoral glands dissected free. (*Basset.*)

1. Dissection of the entire superficial and deep inguinal and femoral lymphatic chain by the method of Basset. As seen in Figs. 9 to 12 this method consists of an incision opening the entire inguinal canal and subperitoneal spaces in the iliac fossa superior to the iliac vessels. After this chain has been lifted out, attached

to the round ligament, the femoral glands are dissected out around the saphenous and femoral vessels. Now comes the point of special value. Poupart's ligament is cut across over the femoral ring (Fig. 11) and the deep gland situated beneath it freed with its attendant fat and lymph vessels. The round ligament is then tied off at its entrance into the peritoneal cavity and the entire lymph gland mass excised. The deep epigastric vessels have to be ligated close to their point of origin in order to permit of a clean dissection. The femoral ring is closed by suturing the internal oblique to the femoral fascia, Poupart's ligament is then sutured over this and a small drain placed in the deeper subperitoneal space. In all instances both sides should be cleaned out by a separate incision in this radical manner. The primary tumor of the vulva is kept away from the operative field in the inguinal region during and after this first operation. Only a sterilizing dose with the Coolidge tube and ordinary antiseptic treatment is employed to keep it clean.

2. Two weeks later the inguinal wounds have healed usually by first intention. We now proceed to an excision of the vulva, using neither scalpel nor scissors but only the cautery-knife. No attempt is made afterward to close the entire wound by a dissection of flaps. A half-dozen silkworm-gut sutures are used merely to approximate the skin edges. Thus a considerable surface is left denuded. No dressing is kept on the wound after the patient is back in bed. Under the open-air treatment with the occasional assistance of dry heat and the frequent irrigation of the vulvar wound with Dakin's solution, we have obtained rapid granulation and none of the necrosis and infection that otherwise in my experience has been uniformly associated with these extensive vulvar excisions in old women.

By the two-stage operation we separate the clean surgical glandular dissection from the necessarily dirty vulvectomy. It means two fairly short operations instead of one very long one. It reduces postoperative necrosis and infection to a minimum. It eliminates the danger of implantation metastases. Since the tributary glands are removed, there is no danger of a spread during the two weeks interval. I believe this method of operation has distinct advantages and I trust others will find occasion to give it a trial.

The study of cancer of the vulva is so closely associated with the atrophic and hypertrophic forms of chronic vulvitis in the menopause variously classified as kraurosis, leucoplakia, lichenification, Paget's disease, etc., that every etiologic analysis must be combined with a study of these precancerous conditions. Through good fortune I have had occasion to observe recently six cases of kraurosis vulvæ and obtained tissue from them for histopathologic study. This led to the discovery that there exists at present absolutely no reliable data concerning the normal anatomical and histological changes in the external genitals of women after the menopause. The pronounced difference in the extent and type of vulvar involution is perhaps familiar to all, but the factors entering therein, the relationship to kraurosis and to cancer, together with the associated histologic changes opens up a wide field for investigation. A careful examination of the external genitals of 100 old women at the City Infirmary that I made this spring revealed the fact that certain definite types existed, varying from a vulva that resembled in almost every way, that of a young woman to an extreme type of obliteration of labia and clitoris that corresponded to kraurosis in all ways but the parchment-like skin. The field has proven to be so broad that it will require further study before satisfactory conclusions can be drawn and hence must be included in a later publication.

REPORT OF A CASE OF PSEUDOHERMAPHRODITISM.

BY

H. D. PURDUM, M. D.,
Clinical Director Springfield State Hospital,
Sykesville, Md.

(With three illustrations.)

The idea that we as medical men are always interested in the unusual, has prompted me to report a case of pseudohermaphroditism which has recently come under my care at the Springfield State Hospital, Sykesville, Maryland. This case was admitted in February of this year with the following history:

Father, living, sixty-eight years of age, cobbler by occupation, intemperate in habits, enjoys fair physical health; mother, living, fifty-eight years of age, temperate, somewhat unstable mentally, though in good physical health; consanguinity of parents denied. There are two brothers and four sisters living, some older and others younger than patient, all in good health and normal sexually; no brothers or sisters dead. One paternal aunt was insane.

Patient was born in Maryland and is now twenty-seven years of age. There were no accidents or birth complications but as a child she was frail, unhealthy, developed slowly and had a group of spasms during her second year. At the age of fifteen she became ill for a short time and judging from the description given by her relatives this attack was more psychic than physical in character; from that time on she had hemorrhages periodically from the gums. Patient attended the public schools in her community for eleven years but progressed no farther than the fifth grade; this lack of progress was not due to any want of diligence on her part but to her defective mental state. In the way of occupation she busied herself with household duties. She also attended church regularly and was inclined to be very religious. At the age of fifteen the patient became aware that there was something wrong with her sexually; this realization no doubt brought about the attack of mental depression spoken of above. From this time on she was unable to properly adjust herself to her environment; while she, up until this time, had been considered a female, and has dressed as such since, the attributes characteristic of the female sex did not appear, but instead her voice changed to that of the adult male and coarse brown hair put in its appearance on the lower half of the face, chest and extremities. From a social standpoint patient was in a most awkward position. She was shunned by both sexes as well as by her relatives. She spent much time trying to remove the hair from her face with small tweezers but the growth was too rapid and the task too painful and laborious. She attempted to get something out of life by associating with the children of the neighborhood but the parents of these children forbade them playing with her because of her peculiar anatomical make-up. Patient had always slept with a younger sister. When this girl attained the age of puberty they developed an abnormal fondness for each other. This was so noticeable that it was necessary to separate them by placing the patient in a single room in an inaccessible part of the house. At this time patient began showing definite signs of insanity. She grew despondent, pessimistic and felt persecuted. She made one more effort, however, to adjust herself by trying to win the attentions of the young men who visited her sisters but meeting with no success she felt that her future was ill defined. She became violent and attacked those about her, eventually becoming such a source of danger that it was necessary to have her committed to this hospital.

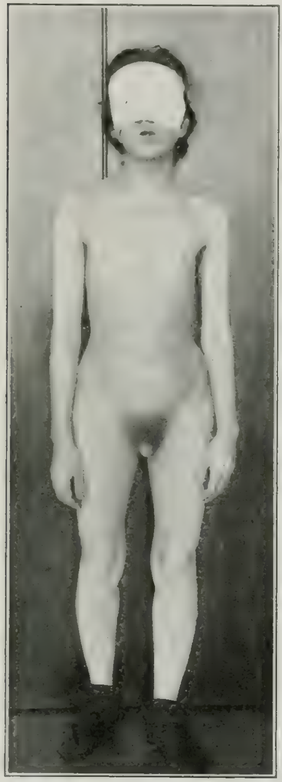
Fig. 1.

On admission her physical and mental defects were easily discernible. However, she was placed on one of the female wards much to the astonishment of the nurses. The first twenty-four hours following her admission were uneventful. She remained in bed, took sufficient nourishment, slept well and was tidy in habits, but during the second night toward morning she got out of bed, took hold of the night nurse and tried to throw her on the floor, saying, "Give me what I want or I will hurt you." After a considerable struggle the night nurse released herself from the patient and got into the chart room, from where she was able to telephone for assistance. The night supervisor on her arrival was confronted with the same state of affairs. To her the patient said, "If you will let me do what I want I won't harm you." It required three nurses to overpower the patient and place her in isolation. Since then she has been kept away from the female sex as much as possible.

The mental examination was unsatisfactory owing to patient's lack of coöperation but some interesting facts were elicited. Patient was found to be perfectly oriented for time, place and person and to have some grasp on her environment. Her school knowledge is limited though equivalent to a fifth-grade education. She measured ten and one-half years by the Binet-Simon scale. Her memory as well as judgment and reasoning harmonizes with her mental caliber. During the interview some reactions were gotten which are of special interest though patient was moody and not at all inclined to talk. She stated that her two oldest sisters and brothers were married and had children and that her two single sisters menstruated regularly and showed a normal fondness for the opposite sex. When quizzed closely regarding her sexual feelings she said, "If I had to marry, you understand I don't expect to get married, I would marry a girl rather than a boy because I am fonder of the girls than I am of the boys." She admitted that the youngest sister, with whom she slept, used to excite her sexually and that they were separated for this reason. She could not be induced to speak regarding the trouble she had with the night nurses.

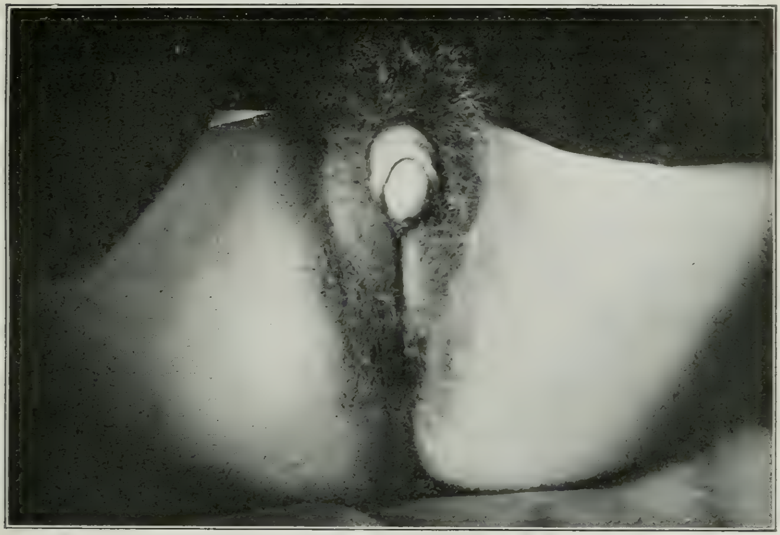

FIG. 2.

The examiner asked her whether she was a boy or a girl and she said "I am neither, I guess." Patient then became morose and irritable and refused to react to questions further.

The physical examination revealed the following facts: height 4 feet 7 inches, weight 70 pounds, T. 98.6, P. 90. R. 20, hair reddish-brown, quite coarse and rather abundantly distributed over lower half of face, chest, thighs and legs. Skin dark, coarse in quality and rough to the touch. Thyroid and lymphatic glands not enlarged. Facial features angular. Palate high and narrow. Nasal septum deflected to right. General type of frame distinctly masculine. Voice is resonant and that of the male sex. Muscular system small though of good tone and force. Heart and vascular system negative. Blood pressure, 135–70. Respiratory system negative. Mouth is untidy. Breath offensive. Tongue and gums partly covered by disintegrated blood, patient having bled from the mouth the night before the examination. Abdominal organs negative. Special senses are acute. Some finer tremor of extended tongue and fingers. Pupils 2 ½ mm. in diameter, circular, equal and reacting. Deep reflexes hyperactive. Coördination is good. Babinski's phenomenon and ankle clonus negative.

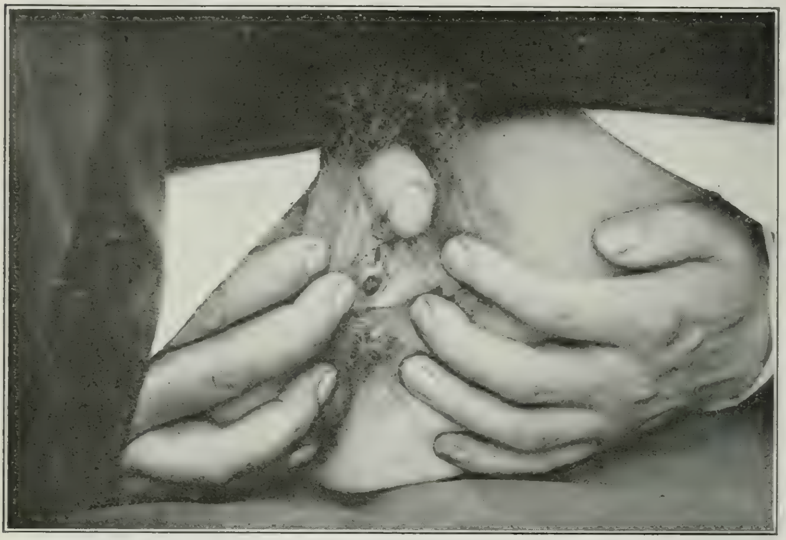

FIG. 3.

Laboratory findings: Trace of albumin and a few coarsely granular casts were found in the urine as well as much mucus. The presence of the mucus was accounted for by her sexual excitement at the time the specimen was collected. The Wassermann reaction of the blood was negative.

Two days after patient's admission she was photographed and an examination of the sexual organs made. A description of the general contour of the patient is unnecessary because the accompanying photograph is quite convincing, but a detailed description of the sexual organs is necessary. Labia majora well formed and normal in appearance. Labia minora rudimentary. Hymen present with an opening which would admit the finger. The ducts of Bartholin's glands open in their normal position. The meatus urinarius is normally situated. The pubic hair extends well up on the abdomen though owing to its color it is not well defined in the photograph. A penis is present in its usual position, 5.5 cm. in length, increasing to 10.5 cm. when in a state of erection. Its circumference also at this time is 7 cm. There is an absence of foreskin and the corpus spongiosum does not appear to be as thoroughly developed and elastic as are the corpora cavernosa. For this reason when the penis is in a state of erection it curves down slightly. There is a parallel groove on the inferior surface of the penis representing the incomplete male urethra and an indentation at the apex of the glans penis on the site where the external meatus should have been. A visual examination of the vagina was attenpted but without success owing to lack of coöperation on the part of the patient and the small opening through the hymen. However, an olive-pointed probe was introduced to a depth of 9 cm. posteriorly and 6.5 cm. anteriorly. By introducing the index-finger through the small opening in the hymen the examiner was able to palpate a large button-sized body on the anterior wall of the dome of the vagina. The vaginal space seemed to be quite roomy and normal in this respect but the uterus could not be palpated and after an extended search externally and internally no ovaries or testes were found. A rectal examination also proved unsuccessful.

While the mammary glands, contour of the body, voice, hair distribution and muscular development are distinctly masculine, the female characteristics of the genitalia are more pronounced than the male and the periodical bleeding from the gums would make one suspect vicarious menstruation. From a psychic standpoint, at times during patient's past life her sexual feelings have been those of a female, at other times those of a male, but at the present time the male feelings seem to predominate.

IN MEMORIAM

JAMES ROY FREELAND, M. D.

BY

DR. CHARLES B. SCHILDECKER,
Pittsburgh, Pa.

James Roy Freeland, born in 1883, received the degree of Doctor of Medicine from the University of Pennsylvania in 1904. After an interneship of two years at the German Hospital of Philadelphia he was appointed Clinical Clerk at the Rotunda Hospital in Dublin, Ireland. At the conclusion of his clerkship he took the degree of Licentiate of Midwifery and shortly after was appointed Assistant Master by Dr. E. Hastings Tweedy, the then Master of the Rotunda. He was the only non-British subject who had held this position up to that time and remained in this post for two years. His duties in this position included lectures and quizzes to doctors and nurses in attendance at the Rotunda. He was very popular in this capacity because of his ready wit which rendered his lectures interesting and assured the attention of his hearers. He was a Member of the Royal Academy of Medicine of Ireland, and the British Medical Association.

In 1912 he returned to this country and was appointed Obstetrician to the Western Pennsylvania Hospital of Pittsburgh, Pa. At the Buffalo meeting of the American Association of Obstetricians and Gynecologists held in 1914, he was elected a member of this association. He was a member of the American Medical Association and a Fellow of the American College of Surgeons.

During his career in Pittsburgh he made an enviable record as an obstetrician, for in addition to his professional skill he had the ability to make and hold friends.

He contracted pneumonia late in May, 1917 and died on the twenty-ninth of May. His untimely end was deeply regretted by his professional associates and numerous friends and patients.

PLATE I

AMERICAN JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN
NOVEMBER, 1917

JAMES ROY FREELAND, M.D.

BORN, 1883. DIED, MAY 29, 1917.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Thirtieth Annual Meeting held at Newark, N. J.

September 17, 18, *and* 19, 1917.

First Session, September 17, 1917.

The President, John W. Keefe, M. D., *in the Chair.*

The scientific sessions were opened with the presentation of the President's address.*

Dr. Gordon K. Dickinson of Jersey City, read a paper on

A PLEA FOR A MORE GENERAL USE OF COLPOHYSTERECTOMY, INCOMPLETE, IN CHRONIC METRITIS.†

DISCUSSION.

Dr. Robert T. Morris.—Dr. Dickinson has brought up some fundamental points which are extremely important in the consideration of this subject. A woman is not a woman any more than a man is a man. Our surgery, conservative or otherwise, must be molded according to the individual woman, her age, her wishes with regard to children, her objection or otherwise to an incomplete operation, with the possibility of a recurrence of the condition. All these things belong to the individual woman.

In considering the subject of decline which Dr. Dickinson brought up, and this is fundamental to the whole question, he did not make a clear distinction between nation and race. That must be kept clearly in mind. In this country there is a more rapid decline than in other countries, because in this nation we have not developed strong racial types. When Nature establishes cultural limitations in the development of a race, she strikes at the female sex first among plants and animals, and secondly we find more forms of arrested development among women than we do among men. Very few women are 100 per cent. feminine. We find the masculine type frequently with the pyramidal arrangement of pubic hair and the short clavicle. We find various changes which I need not enumerate here, but when the sexes approach each other in type, the anatomy and mentality associating themselves, the mentality has a tendency to represent the opposite sex in the course of decline. Decline does not mean that mentality may not be of the highest quality. Some of the most brilliant and valuable members of society among women are those who are masculine. They are not the ones to breed, they ought not to breed, they have no business to breed, and we have no business to help them to do so. That is not their function, but nevertheless they represent a mental state which on the whole is tremendously valuable for society.

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* For original article see page 733.

† For original article see page 740.

There are two reasons for the rapid decline in this country. The Puritan and the Cavalier, who represented strong racial types, have now reached cultural limitations and are on the decline, and you will find, as you will find among all animals and plants during decline, a tendency of the sexes to approach each other in type. The absence of progeny is more noticeable, and the Puritan and Cavalier reach cultural limitations just as all animals and plants do. Another feature is that we are hybridizing too many sub-species of man. In this country, without emigration laws, we have allowed so many representatives of different sub-species to enter that *homo sapiens* is irregularly crossed. We have what Burbank has stated is bound to follow, a crossing of species that should not be crossed in breeding, consequently we have a rapid decline. Nature strikes at the sex organs of women first when decline is in progress. The sex functions are closely allied to mentality and will follow the anatomy because it is a physical matter. The mind is merely an expression of the physical force expressed in the individual.

Dr. Albert Goldspohn, Chicago.—The doctor's argument for conserving the ovary and its function, I sympathize with very heartily. There is one feature about this operation that some would object to for the same reason that they object to having the abdomen opened and the uterus cut into in order to find out what is the matter in it. Therefore it is in order to consider what may be done without operating, to help the cases that are not extremely bad.

The use of tincture of iodine applied to the endometrium, say about twice a month, in effective manner, will improve very many of these patients so that it is unnecessary to operate. Chloride of zinc will be needed once in a while, mostly during or near the menopause. It is destructive in its effect and may annihilate the endometrium, either stop menstruation or diminish it very materially, thus inflicting upon the younger woman a serious injury. But how shall we apply these remedies efficiently as office or home treatment? Certainly not by the ordinary applications now in the market. These are cervical applicators. If a liquid is to be applied efficiently to the endometrium, including the fundus, it is necessary to dilate the cervical canal with sounds the same as we would stretch a stricture of the urethra with a large sized sound, but one with a lesser curve. The woman will need to have a good dose of morphin, or the cervical canal must be anesthetized with carbolic acid or cocain. Ample dilatation to something like 25 or 30 French should be made first, under an aseptic technic; then the application must be made with some kind of syringe applicator, not by wires wrapped with cotton, and dipped into the liquid and run up, the liquid stripped off thus cauterizing the cervical canal excessively and doing nothing to the fundus. A syringe is absolutely necessary with a long and slender nozzle which is covered with absorbent cotton. The air must be forced out, and the cotton must be previously made wet with the fluid to be used; and then immediately after such an ample dilatation the nozzle is introduced without any difficulty. You inject from 2 to 4 c.c. and swab about well, and get out before the uterus has time to contract. Such intrauterine treatment frequently does much more good than curetment, if repeated several times at intervals of two to four weeks, and applied preferably soon after menstruation.

The diagrams of Dr. Dickinson represent to me more a resection of the fundus of the uterus rather than a hysterectomy, because not enough tissue is removed to warrant it being called a hysterectomy. However, the operation is a very sensible one, and in my experience the cases that will not submit to the kind of medical treatment outlined, will frequently require in addition to resection of the fundus also the removal of the tubes, leaving part of the endometrium and one or both ovaries to continue menstruation.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—It is a pleasure to notice from the title of this paper and the discussion that time-honored and ordinary practices again come under revision. Modern science has brought forward new aspects of this subject that must control our therapeutic action in these cases. The principle enunciated by Dr. Dickinson that conservation shall govern our work, leads me to call attention here to the newer aspects of menstruation. We know that the ovaries are not solely the cause of menstruation; that we have the hormone not only of the ovary but the hormone of the endometrium, and perhaps as has been suggested, we may have the hormone of the breasts to consider. To ablate the entire endometrium would inflict a violence not only upon the sexual physiology, but upon the nutrition and chemism of the entire body. We must therefore hesitate to act in a radical way, using the cautery for the destruction of the endometrium, or often doing what is only a partial operation, removing a part of the endometrium as suggested by the essayist.

A new aspect to this question is based on the effects of toxemia upon all glandular structures, either from intestinal stasis, or from an infectious focus located in the tonsils, the posterior nares, the teeth, the gums, the jaws, or elsewhere. The immediate effect of such toxemias upon the glands of the body spells blight of glandular organs. According to my observation, many of these are cases of metrorrhagia and will return to the normal if we look after the toxemia that is present in many of them. If we can eliminate the toxemia or the foci of infection we can bring back the sexual organs to the point of carrying on their normal function.

Dr. Dickinson (closing).—I wonder if Dr. Morris heard the first part of my paper. I would like some time to write more of a sermon than a medical discussion on the constant struggle between the soul plasm and the germ plasm. I alluded in my paper to foreign countries, where the ethics are not the ethics of the United States. If we go from here to England, we take a step down, and if we go from here to Germany, we step farther down, and still farther down when we go to Italy, to the Balkans and some of the other countries where the germ plasm has ascendency. In this country Mother Grundy conventionalities lead to the development of brain. We have large minds, but among the lower class, the plebeians, the class of the other side, we see children. A good deal can be said, and very entertainingly, on this subject. We are developing in this country mules, physiologically speaking. Our old friend Emmet, whose book I like to read over and over, the same as I do my Flint, lays a great deal to climate. There may be something in it.

With reference to the remarks made by Dr. Goldspohn and Dr. Pantzer, I do not see how tincture of iodine can effect a cure, nor do I see how getting at the focus which caused this trouble can help these cases because they are terminal. They are fibrotic. The condition that has produced the trouble is away in the past.

DR. ELLIS W. HEDGES, of Plainfield, N. J. read a paper on

PHYSICAL CONDITIONS IN WOMEN WARRANTING STERILIZATION.*

DISCUSSION.

DR. EDWARD J. ILL, Newark, N. J.—Dr. Hedges has touched upon a very, very serious question which is going to be abused just as much as the removal of the ovaries or the removal of the uterus was. We have had an excellent exposition this morning telling us why we must conserve these organs. The sterilization of women is a perfectly legitimate and proper procedure. I think the first paragraph of the doctor's paper is along the right line; in other words, we must be exceedingly careful which cases we subject to this operation. I think we all agree that the state has a perfect right to sterilize epileptics, the chronic criminals, the insane, and the idiots—whether males or females, does not make any difference. We can also say that cases of repeated Cesarean sections should be sterilized if the patient's best interests are thus served. I have performed Cesarean section three times in succession within a couple of years. I thought that was the limit, and I sterilized this woman; I do not remember whether she was sterilized with or without her consent.

As to chronic nephritis, I am not quite sure we have a right to sterilize women suffering from that condition. Usually a patient who is pregnant and has a chronic nephritis, can be carried along under proper diet and under proper care and no mischief will result. That is an entirely different thing from the woman who comes to this hotel, for instance, on a Sunday evening, takes a big dinner, and you see her the next afternoon with the urine loaded with albumen, or hardly any urine in her bladder. A case with a chronic nephritis of a mild, not the severe, type where the woman cannot lie down, where she has anasarca, is a different thing. I am referring now to the light type of case and here we have no reason to interfere with her normal functions.

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* For original article see page 745.

Some thirty years ago, when everybody was removing pus tubes and ovaries, I asked an old and experienced practitioner in Newark what he thought became of these cases. I had wondered what had become of these women before. He related a few cases to me in which he had evidences of infection on both sides. He mentioned one case where the woman had two or three children following the disease. I immediately stopped removing pus tubes, except in that one particular form where there were recurrences. I have seen a number of children born, after women had been cured from a pyosalpinx, by other than surgical means; so I am very strongly opposed to sterilizing a woman for the reason that she has pus tubes. One naturally asks what is the frequency of gonorrheal diseases. Take our own city of Newark and my own practice. I do not know that I see two prostitutes in my office in a year; but I do know from an actual count that 22 per cent. of all women that come into my office have either gonorrhea or residual symptoms. These women are not all sterile. Twenty per cent. of all women are not sterile, so I am opposed to that operation.

There is one condition the doctor has not spoken of that absolutely demands sterilization; I refer to the Watkins operation in young women. Such patients cannot give birth to children, they cannot even go along with a pregnancy after the third or fourth month.

I am glad Dr. Hedges has brought this matter before us because it needs a thorough discussion. In these days of commercial surgery, it is well worth while to establish a limit of what we are permitted to do in this particular field.

Dr. Herman E. Hayd, Buffalo, N. Y.—This has been an exceedingly interesting paper to me and more interesting on account of the splendid discussion of Dr. Ill. There is no question but what Dr. Hedges' invocation was most beautiful, that we should seriously, reverently, and with the fear of God operate upon women; but, it seems to me, he suggests an omniscience on the part of the surgeon that does not exist in this mundane sphere. For him to say that such and such a case of diabetes, and that such and such a case of chronic nephritis, is going to die is absurd. It is unscientific. It is too sweeping, and, moreover, that we possess in the way of surgical qualification such an infinity that we are going to be able to carry these people through these surgical undertakings without a high mortality, is equally absurd in my judgment and equally extravagant. I believe that sterilization might be justifiable in these cases of chronic nephritis, tuberculosis and diabetes, provided these women are about to die of some other unrelieved pathological condition, such as perforating ulcer of the stomach, or a duodenal ulcer, or an acute gall-bladder trouble, or an acute appendicitis. By all means sterilize such women, if it is convenient and does not increase greatly the mortality, but to deliberately operate upon them for such conditions as Dr. Hedges refers to I feel is a position that the members of this Association should not and ought not possibly endorse. Nor can we assume that every woman who has a pus tube is going to be sterile, because I have confined too many women whose husbands I have treated for active gonorrhea, and many women I have also treated for gonorrhea who have subsequently become pregnant carried their babies until the period of their confinement, and have remained well afterward. I will admit that all of them do not, but a great many of them do.

So far as the State is concerned, I agree with the doctor that we should operate on criminals and limit the possibility of marriage in these individuals so as to stop the procreation of criminals and the derelicts of society. That is an entirely different proposition. From a scientific point of view, as I look at this paper, it seems to me the doctor's conclusions are most sweeping and not at all warranted.

Dr. Gordon K. Dickinson, Jersey City, N. J.—I have been doing surgery and have been connected with hospitals for thirty-seven years. During that time I have been associated with some of the greatest men in surgery. I have seen some of the work myself. I never could get the courage to sterilize a woman, except when there is a narrow pelvis, and there is no hope of getting the baby out except through repeated Cesarean section. In the case of a woman with a good physique, where the surgeons are clever, and the woman goes to a hospital, repeated Cesarean section may be all right. The Lord has not given me the brains to say it is not, but as for other sterilizations, I think such surgery is not called for. I think if we feel the necessity of saving a woman from pregnancy, if, after careful study of the woman as well as the condition, we feel it is wise to sterilize her, before doing so we should advise other measures which are well known and which are not surgical.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—I have enjoyed the paper of Dr. Hedges and the discussion very much; but with all of his conclusions I cannot agree. I am not bound by the dogma or the rules of any church, and when I find that a patient in my judgment will die unless the uterus is emptied, I do not hesitate to empty it. But I do hesitate to arrogate to myself judgment as to whether future pregnancy shall take place. There are certain conditions which have been mentioned, and I will not dwell upon them, which may justify that procedure, but, it seems to me, that the doctor's enthusiasm has carried him beyond the sphere of the private physician. If the State in its wisdom makes laws to prohibit the marriage of defectives, or makes laws that will necessitate the sterilization of this class of people, in obeying those laws we will be considered good citizens. To make a law for ourselves as broad as the doctor has laid it down, I am free to confess my conscience will not permit. I think that if the doctor will look at it in this way, that these married women will probably only become pregnant for one man, why not sterilize the man instead of the woman, as it is just as simple an operation, and less dangerous, and I feel sure that it would not be so often done. I believe in treating our wives and our mothers just as we would be treated ourselves, and I do not believe it is within the province of the doctor in some of these conditions to place a woman so that she cannot become pregnant. If she should not, it is the physician's place to tell her so and to tell her husband, and it is their business to say whether or not she shall become pregnant, and not ours. Human beings must look out for their own welfare and comfort to a certain extent, and it is not the province of the physician to make things too easy for them.

Dr. Robert T. Morris, New York City.—Dr. Hedges' paper is all right, but it requires elaboration. Diabetes is not a disease, it is a symptom, like a cough. I would not think of sterilizing a woman for diabetes until I had made an attempt to trace and find its cause. If an individual in one case squeezes the islands of Langerhans because of a chronic pancreatitis due to colonic infection, I would not sterilize the woman for that kind of diabetes. We have other means. Supposing enteric disturbance in a woman is due to upset innervation of the sympathetics of the enteron caused by eye muscle imbalance, you would put on glasses before you took her ovaries out. As I have said, the paper is all right, but it needs elaboration.

In connection with tuberculosis, we know that more than 50 per cent. of all people in the civilized world have evidences of tuberculosis of one sort or another at some stage of their lives. This is a matter of postmortem records. We cannot gainsay it, so that we have got to specify in Dr. Hedges' paper what kind of tuberculosis we have to deal with. In tuberculosis of the lungs that is advancing and uncontrolled, I might say yes, sterilize the woman. In some cases of pyosalpinx we have plastic operations to fall back upon; we have a number of conservative things which may be done in some cases of pyosalpinx. We must all take out pus tubes that are causing peritonitis, but confine the sterilization to a relative sterilization, depending upon the removal of the tubes alone. Even my statement in this connection is too general and requires elaborate dissertation.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I would like to put a general question, not directing it to the essayist or to any particular discussor. I would like to ask what we are to do with a young woman who, in the toxemia of pregnancy, develops hyperemesis and exhaustion follows until dissolution is imminent, and counsel advises the termination of pregnancy? When that is repeated a second time, and again a third time, what shall we do relative to the matter of sterilization with such an individual?

Dr. William E. Darnall, Atlantic City, N. J.—I sympathize with Dr. Hedges and the knocks he has received. I do not believe he meant to say that every case in all of these various classes he has enumerated should be sterilized, but I do believe that there are cases in each class that have to be sterilized. In other words, as

Dr. Morris has said, it all depends on elaborating the case. After a very thorough study of the case and an elaboration of the whole makeup of the woman's constitution and her tendencies, perhaps there are cases in each class that need to be sterilized.

It is hard to read a paper of this sort without having it misunderstood. The moment you advise sterilization for diabetes or for Bright's disease or nephritis, one immediately thinks that it applies to every case rather than to the individual case. After all, it gets down to the same thing, that every one of our surgical problems means the consideration of the individual.

Dr. Hedges (closing.)—I seemed to have stirred up trouble and I wish I had time to cover that part of the paper which I did not elaborate sufficiently. But to begin with the adverse criticisms that have been generously given here, I would like to take issue with Dr. Ill, and I feel that he has recommended sterilizing in some women where I would not. He takes the position that where a Cesarean section has been done on a women two or three times for the delivery of her baby, she should be sterilized. I have read repeated accounts of five or six pregnancies where the women were all delivered by Cesarean section, where there was no rupture of the uterus, and where the operation went through safely. I purposely left that out of my paper. I do not think that such women ought to be sterilized. Dr. Ill goes farther than I do in claiming sterilization in such cases.

Every one seems to have attacked the chronic nephritis argument. I did elaborate sufficiently there to say that when a woman presented anasarca, rapid heart and dyspnea, with extreme symptoms of poisoning from chronic nephritis, she should be sterilized. I purposely left out the milder cases of chronic nephritis which might go through safely. When the text-books tell us that 30 per cent. or more of mothers that become pregnant in conditions of chronic nephritis and die when otherwise they would not die, we are perfectly warranted in going on with sterilization.

As to sterilization in case of pus tubes, I perhaps should have made a little longer argument in relation to that. I passed that phase of the paper over rather casually. My own practice is that if a woman suffers continuously and repeatedly after a faithful trial of douches and other palliative measures, I take them out, otherwise I let them alone.

Dr. Bonifield spoke of consultation in these cases, and I did take pains to say that a consultation should he held, and that an operation should never be done without being sanctioned by other men of repute.

As to tuberculosis, I mentioned in the paper cases of pulmonary tuberculosis particularly. I agree with Dr. Morris that every one of us has tuberculosis somewhere or other at some time, but there again the figures are on my side. If a woman with a cough, fever, and an active process in the lung becomes pregnant, she is going to die either at the time of delivery or shortly after, and if we can get hold of her in the second or third month and get rid of the fetus, she has a mighty good chance to live. I do not see why we should doom her to certain death by letting her alone, and I stand by my guns on that. I believe such a woman ought to be sterilized.

Dr. Hayd.—Why not abort her? It is much easier. She may die before she gets pregnant again?

Dr. Hedges.—That is another thing, but I was discussing the question of sterilization, and that is better yet because I do not think she ought to become pregnant at a future time, if it is possible to prevent it.

Dr. Edward J. Ill, of Newark, N. J., presented a .

CINEMETOGRAPH DEMONSTRATION OF THE OPERATION FOR THE CURE OF COMPLETE PERINEAL LACERATION.

This demonstration was given to supplement a paper read before this Association seven years previously. About eighty cases have been done by this method without a failure and the patient, on whom the operation shown in the film was done, was presented for inspection of the ultimate result at St. Michael's Hospital, Newark.

DISCUSSION.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I have been particularly interested in the demonstration of this operation for complete perineal tear. I am interested in it because I feel flattered; I have been doing the same radical operation since the days of our lamented Dr. Dunning, who witnessed our first operations along this line. I am flattered to know that one of Dr. Ill's capacity and skill is doing that same thing.

Our plan is a little different in that we trim away the cicatricial line or cord made by the granulating surface at the junction of the vaginal and rectal mucosa. This junction granulating together will form a contracting band which I feel it is better to remove. It has been our plan to introduce sutures of buried chromic catgut, No. 1, when it comes to forming the perineal body, from within outward. This necessitates the catgut being threaded at either end on two needles, or taking the needle off when it has been brought from within outward, and rethreading on the other end to reintroduce it. The introduction of the deep suture on the left side is best done with the right hand from within outward; the end then passing through is rethreaded. On the right side of the patient it is best introduced with the left hand from within outward. This gives a much better equalization of the natural bite, and a more symmetrical approximation of the surfaces that are to be brought together. Our first suture introduced to form the anterior anal wall is double chromic catgut, and after beginning at the apex of the wound it is brought down, never encroaching upon the rectal mucosa, but turning the rectal mucosa toward the lumen of the gut by a running suture. This suture is made to include the ends of the external sphincter and is left until after the perineal body is formed by the previously buried chromic catgut sutures. This suture is then utilized to approximate the skin by a running subcuticular stitch, so that when the operation is completed there is no suture penetrating the skin, which has two virtues. I believe it eliminates the feature of infection, but more than anything else, it is a matter of decided comfort to the patient not to have the perineal skin punctured by retention sutures.

Dr. Charles L. Bonifield, Cincinnati, Ohio.—I am not at all surprised to learn that Dr. Ill has had a large series of cases that have been successful because his operation is based on proper principles. The denudation, as we all know, is the denudation of Tait, and I simply wish to refer to two points in which the operation that I have performed for years differs from his. In the first place, instead of sewing the bowel, I make the denudation exactly as he does, using the knife entirely. Then, instead of sewing this together as he does, I dissect the rectum loose to a higher level, and leave the forceps on until the completion of the operation. This avoids the necessity of sewing the rectum. I close the sphincter ani with a figure of eight suture of chromic gut build up the perineum with a tier suture of plain gut, as recommended by Martin, of Berlin, and close the mucous membrane and skin again with fine chromic gut. I do not use any of the sutures the doctor describes; when he uses silver wire to include all tissues, I have three layers of ordinary catgut. It is simply a matter of bringing a large quantity of tissue in a single row of sutures, or carefully approximating the edges in that way, but the particular point is pulling the rectum down so that there is no occasion for sewing it and there is no danger of infection from it.

Dr. William H. Humiston, Cleveland, Ohio.—It is a great comfort for a woman to have a laceration of this kind repaired so that the sphincter ani will functionate and prevent the discomfort which she may have labored under for months and even years. I formerly performed these operations with sutures that required subsequent removal, namely silkworm-gut and silver wire, but I found they were a source of irritation. The principle of Dr. Ill's operation is, of course, the correct one, but I think the same result can be reached in another way, which to my mind is not attended with the risks that follow the use of retained sutures. Nurses will pull upon the tube in getting around it to dress it and a superficial irritation is produced, followed perhaps by the discharge of pus and infection. With a double tenaculum I take up the crest of the rectocele and I make an incision in the median line. I then denude as high up as I care to and down to the edges of the sphincter ani muscle. I then split the fascia in the median line which exposes the fibers of the levator ani muscle which are retracted. This muscle is funnel-shaped and comes down around the vagina and rectum. I find the retracted fibers of the sphincter ani muscle and unite them with an interrupted suture of catgut, bringing them to the median line and down to the rectum. Then I unite the rectal surface, being careful not to go through the mucous membrane, but go barely to the edge of it, with interrupted sutures. I put two sutures of No. 2 chromic catgut through the sphincter ani and tie them. With a continuous suture the fascia over the muscles is brought together, then with another suture the mucous surfaces down and through the skin to where the sphincter has been joined. If you do not achieve success in these cases within the first four or five days, you will not obtain it at all, and the catgut will last ten or twenty days, giving you a perfect result, provided you have done this aseptically. The idea Dr. Ill brought out, not to use sponges, but a flow of water over the surfaces is a great comfort, keeping the field perfectly clear and aseptic. In this way you avoid pushing the tissues about with gauze sponges, perhaps getting infection from the rectal mucous surfaces into the field of operation.

Dr. Albert Goldspohn, Chicago.—The operation so beautifully demonstrated here is practically and entirely the same thing I have been doing at least for ten years, except that I use silkworm gut instead of wire. The operation, so far as demonstrated, achieves what was achieved by the Tait and by the Emmet operations. It will give good results as far as injury to the sphincter is concerned, but the Tait and Emmet operations have never restored the pelvic floor properly. That requires deeper work within the pelvis. Therefore, my technic will vary from that demonstrated here in this respect: that, after the rectum has been closed, by the first row or double row of continued submucous catgut sutures, with care to avoid infection from the rectal mucous membrane, and before the other steps of this demonstrated operation are done, I raise the mucous membrane deeper within the vagina, from the lateral sulci, and get at the levator ani fasciæ actually, as the Emmet, Hegar, and Tait operations have never done. I hook into these fasciæ on both sides with a needle, and by the resistance that they offer to the pull, I know that I have caught them properly. To get these two firm structures in apposition, it is necessary to use buried suture material and in a transverse direction solely, not coming out to the skin by a circuitous route or purse-string suture; but by deeply buried catgut, hold the opposing fascia planes together near the median line without any other tissues intervening. After that is done, complete the outer portion of the perineum in the manner demonstrated by the essayist.

Dr. Joseph H. Branham, Baltimore.—Will you kindly tell us about the subsequent treatment.

Dr. Ill (closing).—Careful nursing is the important part of this operation, and especially is it important that the first movements should be carefully looked after. The patient is put on the left side, the perineum is pushed down with the left hand of the nurse, and with the right hand she opens the anus and passes a basin underneath. We inject a few ounces of oil to ease the movement. After that the patient is put on the bedpan or commode as any other patient. We insist upon clean gauze upon each side where the sutures are inserted and changed as often as they become soiled.

Dr. Hayd.—Do you catheterize these patients?

Dr. Ill.—We let them pass water if they can, but throw a stream of sterile water over the parts afterward. The oldest case had a tear for twenty-nine years. She had had it so long that she never knew it was wrong to have such a state of affairs until she had a mishap one day. The next oldest was twenty years. These patients have all gotten well. There were about eighty of them in all. Perhaps some of the gentlemen in this neighborhood will tell us of some that did not get well, but in looking them up we find none that have not recovered entirely. I would not put a buried suture so close to an organ that is so full of infectious material as is the rectum. If you get infection of the mucous membrane and you do not have a culture medium in the wound, you will not have difficulty. If you have a culture medium, in the shape of a piece of catgut, you will have failures.

Dr. Charles L. Bonifield, of Cincinnati, O., read a paper on

UTERINE PROLAPSE.*

Dr. Arthur T. Jones, of Providence, R. I., read a paper on

THE OPERATIVE TREATMENT OF PROCIDENTIA.†

DISCUSSION OF THE PAPERS OF DRS. BONIFIELD AND JONES.

Dr. Samuel W. Bandler, New York City.—There are very few operative procedures in gynecology where, in my opinion, after years of experience, one needs to individualize as little, outside of the general principles which have been enunciated by the gentlemen who have read these papers. If a patient has a prolapse of the uterus and has to bear any more children, the vaginal interposition operation, whether you call it the Schauta, Wertheim or Dührssen, is absolutely out of question. If Nature had intended a woman not to bear children, she would never have put the bladder in front of the uterus. She would certainly have put the bladder on the posterior wall of the uterus, but just because the uterus grows up above the umbilicus and toward the ensiform, the bladder must stay on the anterior wall, and you must keep it there in a prolapsus with a patient who may become pregnant. Therefore, we fasten the uterus in the elevated position. Dr. Bonifield spoke of the Gilliam operation, while Dr. Jones referred to the Alexander. I am very glad to hear Dr. Jones speak of the Alexander operation and to hear of its good results, because I have not used it for these prolapse cases, and on simply mechanical grounds it does not appeal to me, but if it worked as well as Dr. Jones said it does, it is a simple procedure. In fact, from the pure enjoyment of doing the operation, I would rather do an Alexander than any other gynecological operation. But I fasten the uterus higher up than that when there is a prolapse. The uterus is large and heavy, and if you look into the pelvis when you do a laparotomy and see where the round ligaments are, and then look at the uterus after having done an Alexander operation, you will find it is away down in the pelvis. It is not in the position I like to put it in a prolapse. I fasten the anterior wall of the uterus up close to the abdominal wall either by a Gilliam operation or by ventrosuspension, and even if the patient is to have children I personally do not hesitate to do a ventrosuspension, but I do not do this operation alone. I sew both round ligaments for a distance of 3 inches from the uterine horn across the anterior wall ot the uterus, which leaves a V-shaped space such as between my index finger and the thumb, and that V-shaped space of the anterior wall of the uterus is sewed to the anterior peritoneum, so that we have a combination of the round ligament operation on the anterior wall of the uterus and a ventrosuspension over the space of 2 inches. I do it always as a suspension, and not a fixation. It is poor surgery to say that we cannot do suspension, and that many of these operations turn out to be fixations. If we cannot sew the anterior peritoneal layer to the uterus in such a way that only the peritoneum unites to the anterior uterine wall, then it is childish surgery. It is thus possible to do a ventrosuspension for this condition of prolapse, but that is not the only thing. Let us see what else we have to do. In these cases of prolapse of the uterus the cystocele, after all, is one of the most important; there is also a rectocele, and while it does not annoy the patient so very much, the cystocele does. The urinary annoyance in these cases of prolapsus uteri is the least frequent of complaints. You can put the bladder where you please if you do not injure the lining, but if you interfere with the lining either by means of the cystoscope or suture which goes too deeply, the patient may have persistent urinary disturbance for years. With the abdominal operation the bladder will be in proper position by lifting the uterus and sewing it up. I make a T-shaped incision, separate the bladder from the anterior wall of the uterus, push the bladder up 2 or 3 inches higher. It is then loosened and I cut away the redundant flap and sew the flap to the anterior wall of the uterus 2 or 3 inches higher than it was. I have simply pushed the bladder higher up on the uterus, and have sewn the vaginal mucosa where the bladder was, and the cystocele is cured permanently. In these cases the cervix must be amputated. As a matter of fact, you cannot get a sufficiently large anterior flap either with the abdominal operation or with the vaginal, which I will speak of in a moment, without resorting to amputation of the cervix. There must be such liberation of the vaginal mucosa around the cervix as to push the flap freely away from the posterior area up to the anterior. This part of the operation in such a case is the same as it is with total prolapse done vaginally. If a woman is thirty-seven years of age, and has had four children, I am not going to refrain from doing the vaginal operation because she may still have five or six children.

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* For original article see page 750.

† For original article see page 752.

Referring to the first paper on the program, which was read by Dr. Hedges, on "Sterilization," I think the doctor was nearer right than most of the speakers gave him credit for. When you individualize and carefully select your cases, you certainly have a right to use your own judgment, and if a woman has had four children, and may have five or six, but wants no more, I take upon myself the responsibility of saying to her, I am going to do for you the vaginal operation, but you can have no more children. Have you enough? Do you want any more? If she wants no more, I think she has fulfilled her duty, and I am going to do the vaginal operation because it is the best for her, and in doing so I sterilize her because I do not want my operation to bring her life into jeopardy afterward, which is not a matter of juggling with our consciences after all. We have the responsibility of these patients as well as our consciences to consider, and we pick out what operation we think is right for the individual case. The vaginal method is to my mind the most ideal operation for total prolapse of the uterus. It brings the uterus out through a vaginal incision; you can take out a wedge-shaped piece from the whole fundus or anterior wall, you can amputate the whole fundus down to the cervix, but that is rather the exception. The bladder rests upon the posterior wall of the uterus and no cystocele can recur. Then comes what I have mentioned in the previous operation, namely, the most important part is to complete the high amputation of this large cervix at or above the level of the internal os, and in many instances in my hands the cervix which I have taken out is as large or larger than the fundus I have left behind. In doing that we circumsize the cervix below the level of the internal os and push the mucous membrane up an inch higher than the margin of the incision from which we started, which means a tremendous redundant area. If you measure the circumference of the mucous membrane when we free it from this attachment, in some instances it is too large. We begin by sewing the posterior part to the posterior wall of the cervix (after amputation) and then pull on this part and that part, leaving absolutely no redundant tissue. Then as you pass sutures laterally you catch the lower borders of the *ligamentum cardinale*. This leaves a large redundant flap toward the anterior wall of the cervix, coming partly from the lateral wall of the cervix, but mostly from the cystocele area, the bladder having been separated from its attachment to the anterior wall of the uterus and from its attachment to the vagina and pushed over from the posterior wall of the uterus. You then cut off the huge flap resulting from the ⊥ shaped incision and sew it to the anterior wall of the uterus from the fundus down to the cervix. The posterior fornix is so large that you can put your fist into it; I am not talking about the upper vagina which, of course, is so large that you can put your whole fist into it. In a well operated case it becomes so narrow that you can scarcely get the tip of the thumb into it. Then comes the most important part of the operation, and that is why the Dührssen operation or any particular name should not be attached to the operation because that makes the average beginner think that all he has to do is to fix the fundus of the uterus and he is done. He is not. If that is all he does, the uterus goes back to its old position. In the perineorrhaphy I go up as high as the culdesac and occasionally enter the same. The posterior vaginal wall is separated completely from the area of the proctocele and up to the fornix. I then cut off a big triangular flap of this separated posterior vaginal wall as large as from the anterior wall, and then sew this mucous membrane from the posterior fornix down. When you finish with that part of the operation, not having yet sewn the levator ani, the upper vagina will scarcely admit a finger. When you finally have the perineum made still higher than usual, the caliber of the whole vagina is reduced to a smaller size than it was originally at adolescence, and I do not know of any case where the uterus has come down. If you bolster the vagina up with an ideal operation on the perineum, you have the prolapse cured so absolutely that it is almost an axiom to say you have done better than Nature made it originally. In the perineorrhaphy part the strong levator ani attachment is the important thing. If the outer skin sutures should slough through, it does not matter, if the levator ani sutures only hold. The muscle is to be dug out from the little burrow on either side and the intervening area of the rectum is separated. We bring the levator ani muscles together, we expose them right out with their sheaths and make our union with three or four sutures. We use two superficial figure-of-eight sutures after the levator ani muscle sutures are tied.

In all these perineal operations I have for the last two years absolutely excluded chromic gut. I do not use it for anything in gynecology. I get the same good results with iodized catgut and fewer infections. The levator ani sutures hold, the superficial sutures hold. Chromic gut will stay ten or fifteen days. Since giving up chromic gut and using iodized catgut, healing takes place without a superficial blemish.

Dr. Gordon K. Dickinson, Jersey City, N. J.—Dr. Bandler has brought out some things which came to my mind when these papers were being read. Every man advances according to his errors, and if that be true, I have had quite some advancement because I have seen a great many cases of prolapse of the uterus come back to me that were operated upon by various older methods. When I began operating we had the La Fort operation, and then the double barrel vagina, and the uterus would go down through either one of the other channels. Recollect please that you must think while you are working. My operation here was disputed as to its nomenclature, whether it was a hysterectomy or not, and this condition is not a prolapsus uteri, strictly speaking, but simply a herniation of the bladder and the rectum downward. If you pass a sound into the bladder you will find the culdesac going down into the vagina, and if you introduce your finger up into the rectum there is a big pouch, the fecal mass comes down, and it gets into this part, rolls around, and makes considerable trouble in defecation. It is a rectocele, it is cystocele, and the uterus that is prolapsed is not entirely the cause of it. As to the Baldy operation of splitting away the vagina from the bladder and stitching it away up on the uterus, it spells failure if the woman is in the child-bearing age. In doing a thorough job posteriorly, as Dr. Bandler stated it, I like to put a circular stitch around the biggest part of the rectal pouch and plicate it inward by the circular stitch. But the main thing I want to get at is how to keep the uterus up. I had a case come to me from Dr. Kelly on whom a ventrosuspension had been done. The uterus was a foot long and about the size of one finger stretched out. I have done the Gilliam operation; I have likewise done the Baldy-Webster and all similar operations, but find that patients come back with pain and tender spots and distress from hematocele and scar tissue.

Dr. Franklin Martin, of Chicago, in one of the shortest articles I ever saw written on this subject, called attention to the fact that in a woman who is bearing children, if you will bring the uterosacral ligaments or the uterosacral folds around through the parametrium close to the cervix, somewhere about the position of the internal os, and suture them together and to the cervix, you will have a good means of suspending the uterus and holding the cervix, then do the Alexander operation, not the Alexander-Adams operation. Do not split the fascia of the external oblique, but pick it up at the external ring, pull it in nicely, and you will never fail.

Dr. William E. Darnall, Atlantic City, N. J.—The question of procidentia is one that confronts us every day. My experience has been much like that of most of you perhaps. I have gotten most satisfaction from the interposition operation which, if properly done, in older women seems to fill the bill better than anything else. I do just about what Dr. Bandler has described, but there is one point in technic which has not been touched on. About two weeks ago I read an article by a New York surgeon. He reported some twenty or thirty cases in which the interposition operation was resorted to and they all did badly. All had trouble with the bladder and examination by the cystoscope showed a pouch on each side. This surgeon evidently did not do the operation right. The point I want to make is this: when you push the bladder up with its lateral attachments, get the whole thing up, otherwise you will have happen just what happened to him.

Dr. Herman E. Hayd, Buffalo, N. Y.—I did not intend to discuss these papers, but if I sat still Dr. Goldspohn might think that I had forgotten all I had so often said with reference to the Alexander operation. I continue to do the Alexander operation in properly selected cases. I have, I suppose, forty women and many of them grandmothers in Buffalo who have stood the test of pregnancy which was his challenge to me, when I wrote three papers on this subject. These women are well as a result of a properly performed Alexander operation.

An interesting thing in connection with prolapse of the uterus which has not been brought out in either of these papers or in the discussion is that, in many of these cases the body of the uterus is not prolapsed at all; it is merely a supravaginal elongation of the cervix; the cervix is simply stretched and torn away from the body of the uterus, and as Dr. Bandler says, the cervix, after he amputates it, is as large as the body of the uterus or even larger. That is the reason why properly directed plastic operations upon the cervix, the anterior and posterior walls of the vagina cure most of these women, and only in the extreme cases of procidentia is an interposition operation necessary in my judgment.

Dr. Bandler brought out a very important point in reference to the treatment of the posterior wall of the vagina. We do not remove enough of the posterior wall of the vagina in most of these cases of relaxed and flaccid vaginæ. We ought to take a piece out and extend the denudation away up to the cervix, even to the culdesac. This point I brought out years ago in a paper I read before the Association on perineal operations. I am delighted to hear from Dr. Jones that the round ligament possesses very much value in elevating the uterus. I always thought the round ligaments only brought the uterus forward. In those rare bad cases of procidentia I have preferred to open the abdomen, where there was much prolapse of the body as well as of the cervix and all the vaginal structures, and have done, as Dr. Bandler has said, a ventrosuspension. I like to suspend the uterus higher up than the Alexander operation does.

I am glad to have the opportunity once more to say that I still do the Alexander operation in properly selected cases and am satisfied it is an ideal procedure for uncomplicated retroverted uteri.

Dr. Humiston.—What do you mean by the tearing of the cervix away from the body of the uterus?

Dr. Hayd.—When I remove such a uterus by vaginal hysterectomy, as I do in many cases, where the woman has gone beyond the child-bearing period, and where the uterus is of no particular good, and where I do not want to open the abdomen, I sew the broad ligaments and round ligaments together and incorporate in one of the sutures the prolapsed bladder, lifting it up in place by that suture. In this way I succeed in retaining these lower structures in place. In many of these uteri, if you will examine them and pull on the cervix, you will find the cervix has been elongated from the body one-half and sometimes an inch and a half from the stretching and tearing away of the cervix from the uterine body itself.

Dr. Joseph H. Branham, Baltimore.—My experience has been so different from most of the gentlemen who have discussed these papers, that I want to say a word on this subject. Anterior fixation I have tried in cases of prolapse, when it was first recommended, with very little satisfaction. I have seen operations done by various surgeons who have had results that were very distressing and very disappointing. I do not believe it is a scientific operation. It may be an improvement upon Nature, but it is a hard thing to improve on Nature.

The operation described by Dr. Bonifield in women before the menopause is simpler and will give more satisfaction than any other. After the menopause, if we have a prolapsus, with a large uterus, hysterectomy is the proper operation in my opinion. It gives the best results, it causes less distress afterward, and there is no more danger. In doing hysterectomy we must be careful to bring the round ligaments and part of the broad ligaments together. I now do it through the abdomen and bring the round ligaments together so as to make the proper support, and if you do this, in my experience, you will get satisfaction in nearly all cases. I have seen more distressing cases as the result of chronic infection of the uterus after an amputated cervix than from almost anything else. Amputation of the cervix is, in my judgment, unscientific. I think it is a poor improvement upon Nature, and I do not believe it is a good operation. I never do it, but I have seen a great many cases where the patients were in such a distressing condition that a secondary and very difficult hysterectomy had to be done. It closes up the canal, secretion gets into the uterus behind the amputated cervix, and the patient is about as miserable as you can imagine.

As far as the anterior fixation operation is concerned, I have tried it in a few cases without satisfaction, and I have seen a good many more cases in which it has been done by other surgeons who are experts, and the distressing urinary symptoms and other symptoms were always present. I do not believe it is a good operation.

Dr. J. Henry Carstens, Detroit, Michigan.—In the consideration of this subject it seems to me it is largely a question of physiology. What have we got? We have muscles that get tired out. These muscles do not hold anything. It is the fascia that surrounds the muscle that holds everything properly in place, and that never tires, but the muscle does. If you have a torn perineum the fascia is also torn. Generally in operating what do surgeons do? They sew together the muscle and leave the fascia. This muscle soon tires out and stretches. If they get the fascia with each muscle, or most of the fascia, and also what is called the pelvic fascia, they will not have so many failures. As to the interposition operation and all complicated operations, I would urge you to read certain proceedings of the New York Academy of Medicine which were published in the American Journal of Obstetrics and Diseases of Women a short time ago. In this article a great many failures are reported. It seems to me, it is a very simple plan to operate after the manner described by Dr. Bandler, and I agree with him entirely. If you have a woman who wants to have children, you do the Alexander operation or the Gilliam operation, restore the perineum, and the uterus will stay in place. Why? Because the woman is young. Her muscles are still strong; her fascia is still strong. By an operation you can hold the uterus in position. But let us take an older woman who is at the menopause or who has passed the menopause, and the uterus comes down. You can sew it up, but what is the result? The ligaments become stretched just as they were, say five or ten years before the operation. By and by the uterus comes down again, and you can narrow the vagina just as much as you like. How in the name of wonder a surgeon can do the interposition operation on an old woman, take out the cervix, take off the fundus, remove the tubes and perhaps the ovaries, and retain a little bit of muscle, is beyond my comprehension.

One of the worst things after all these operations is a diseased mucous membrane. I have such a woman in the hospital now who has had nine children. She is only thirty-eight years of age, but her uterus is coming down. My conscience is such that in her case I do not think she ought to have any more children. I told that woman that I thought it would be better to take her uterus out. She consented, and I removed her uterus; I stitched the broad ligaments together and hung the bladder on that, and then did the proper perineal operation. That woman has been restored and is now in perfect condition. In these cases I would leave an ovary anyhow so that the woman does not get the tumultuous change. She will have no uterus to come down again, and she will not have any trouble which attends some of these complicated interposition operations. The bladder we can hold up in other ways.

Dr. Albert Goldspohn, Chicago.—I am now and have always been opposed to the Schauta-Wertheim-Watkins operation, because the endometrium in such a distorted uterus remains open for infection but not for treatment. It becomes a *nolle me tangere.* If all those gentlemen who have had an extensive experience with the so-called interposition operation have not met any such cases, then my objections may be void.

Dr. Jones (closing).—My paper was a plea for the interposition operation in cases of complete prolapse in older women, and, it seems to me, that the discussion, with very few exceptions, has emphasized that. I feel that it is an operation which, after you have done it a few times, is not complicated. It is easy to do. It does not take as long to do as the ordinary hysterectomy. When you consider the length of time of the interposition operation, you will find it does not take longer than to do an ordinary laparotomy. It is a great satisfaction to see these patients completely relieved of their symptoms. Those men who have not used it, or have only employed it in a few cases, understand it imperfectly, and if they will perfect their technic and do the operation more, they will get a great deal of satisfaction from it.

Dr. Francis Reder, of St. Louis, Mo., read a paper on

CERVICAL LACERATIONS, THEIR SIGNIFICANCE FOR THE PATIENT.*

DISCUSSION.

Dr. Reder.—As I grow older in my work, I appreciate more and more the little things which I formerly often disregarded. Girls I have known in childhood, grew up into womanhood, married, and who were perfectly well, appeared to have gone to pieces after having their first baby. So pronounced was the change that some of the husbands said to me, "My wife has changed very much, doctor. I do not know how to account for it." As a personal matter, I asked permission to examine about ten of these mothers whom I had known during their childhood, and who had always enjoyed excellent health, in order to determine the extent of the cervical laceration. The examination was made six to eight weeks after the birth of the child. I found in each instance that these lacerations were sufficiently extensive to require attention. The intermediate trachelorrhaphy was performed and I have been gratified to find that these women have been quite free from aches and pains.

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* For original article see page 756.

Dr. N. Stone Scott, of Cleveland, read a paper on

ACUTE DILATATION OF THE UTERUS.*

DISCUSSION.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—In confirmation of the doctor's observation, I wish to report two cases occurring in my practice within the last seven weeks. I shall take pains to write out the histories in full for later publication, but I will briefly allude to them now.

The first case was a woman operated on for appendicitis, who had had continuous bleeding for six weeks. She was thirty-eight years of age, had been married many years, but never before pregnant. The breast changes were indifferent and the diagnosis of pregnancy was left in doubt. Fibroid as a possibility was entertained. Upon dilating the uterus I found the phenomena the essayist has described, and for a moment was in doubt as to whether I had perforated the uterus or not, and then with an instrument I felt a perfectly intact wall as I thought. I then opened from above and found the uterus to be relatively small, but not perforated. I removed the fetus through an opening in the uterus.

The second case is interesting. The patient was a young unmarried woman, thirty-eight years of age, who underwent curettage preceding an operation for the removal of multiple fibroids, and I found again the same phenomena. In opening from above I found the uterus normally enlarged by the fibroids within its walls, but otherwise not dilated. I removed these fibroids without having a repetition of the phenomena.

These cases are more frequent than we have heretofore expected from the reports in literature.

Dr. Edward J. Ill, Newark, N. J.—I have heard of these things happening a number of times, but I have never seen them. What I have seen is this: when we thought we had that sort of thing, the curet or sounds had passed through the uterus below the os internum or low down through the posterior wall of the uterus into the peritoneal cavity. Here is my friend from Indianapolis who, when he opens the abdomen, does not find what he has been looking for. Nobody can tell me that a uterus 5 or 6 inches deep is going to reduce to normal size in two minutes. I rather think Dr. Pantzer had perforation of the uterus low down behind or at either side. Possibly the instrument went into the cellular tissue. I have seen a crochet needle go into the cellular tissue behind the uterus. In the cases under consideration you have one of two pathologic conditions, either a fatty degeneration of the uterus or a great relaxation, as we get in abortions with much bleeding. In these cases the instrument though held lightly between two fingers will go right through into the peritoneal cavity. I have seen it again and again. This has happened to my assistants and my colleagues and myself. At one time, some years ago, as I brought the curet back, it had little tissue in it, and I teased it apart with potash solution and found there was fatty degeneration of the muscles. I have no proof that a uterus 3 inches in diameter will dilate to 6 inches in diameter and recontract as soon as the abdomen is opened. If there is a big clot in it we may understand it, otherwise I cannot see why it should be so. When a uterus is found large and soft and we fear going through it, we have always used some of the fluid extract of cotton root, a teaspoonful two or three times in rapid succession. Then you get firm contraction of the uterus and one is not apt to go through it.

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* For original article see page 763.

Dr. William H. Humiston, Cleveland, Ohio.—I wish to detail a similar case that I have had in my own practice. I have punctured the uterus oftener than I know of. In one case I was demonstrating to the class how to avoid perforating the uterus. The woman had had several attacks of appendicitis and was in an attack of this disease when abortion took place. I told the students that a uterus that was three months pregnant was as easily perforated as a piece of red-brown paper. I took my dull curet between my thumb and finger, pushed it in, and it kept going on in without any effort. I told them I had undoubtedly perforated the uterus; that I was going to open the abdominal cavity, which I did, and found that I had punctured the uterus, although I had told the students how to avoid it. I removed the placental tissue that was left, and examination disclosed a puncture in the posterior uterine wall. I removed the appendix, stitched up the hole in the uterus, cleaned out a few clots in the abdominal cavity in the culdesac and she got well. I cannot see how a uterus can change so suddenly, a uterus in which I have curetted to remove the placental tissue. I had a perfect torrent of blood and had to use salt solution to stimulate contraction of the organ, and to avoid bleeding afterward I always pack the uterus full with iodoform gauze as well as the vagina.

I believe we all perforate the uterus much more frequently than we realize. I have had cases of sepsis following curetment at home. These patients were brought into the hospital in a condition of sepsis; we have opened the culdesac, have found pus, and drained it out, and six or eight weeks later in making a radical operation for the removal of a diseased tube and ovary, with adhesions, we have found evidence where the uterus was perforated. I think that notwithstanding the utmost care we can readily perforate the uterus, and I cannot reconcile how in these cases the uterus so suddenly becomes 8 or 10 inches in depth, unless the uterus is measured and the curet has slipped through it.

Dr. William E. Darnall, Atlantic City, N. J.—We have all punctured the uterus, and we know that we can do it very easily; but what Dr. Humiston has said does not explain why a uterus that was 2½ to 4 inches deep suddenly becomes 6 or 8 inches deep when the sound or curet goes clear to the top. It is true, we may puncture the uterus, but the other thing is true, too.

I am quite certain I have never seen a paper on this subject except by my friend Maier of Philadelphia, which was published three or four years ago. In some cases of miscarriage I have operated upon, the uterus has suddenly ballooned out. I am just as sure of that as I am sure that I stand here, because I measured the uterus and proved to myself it had not been punctured. I have had some ten or a dozen cases of this sudden dilation of the uterus. In some of them the abdomen was opened, and after the most careful search no evidence of any puncture was found. I have rather believed the condition to be due to the anesthetic. When you get that sort of condition, the uterus balloons out, and you suddenly find that the u terus is 6 or 8 inches deep instead of 3 or 4 inches, if you stop the anesthetic, the uterus will contract down to where it belongs. I believe the condition may occur and that it is quite common.

Dr. James E. Davis, Detroit.—I think the paper of Dr. Scott is unusually valuable, and I wish to call attention to two or three points, two of them in connection with the physiology. When a muscle is gently or moderately stimulated with an electric current contraction results. For a time we may direct the current upon the muscle that is bellied out in contraction, but after continuing the application of the electric current until extreme irritation is reached, then the muscle wall will flatten out, so that we have a muscle of increased length. Coupling this with the condition to which Young has recently called attention in regard to the enzymes or the hormones that are produced by the epithelial chorion in pregnancy, which brings about a condition of edema in early pregnancy, it seems we have two conditions that may explain what we have taking place and to which the author has drawn our attention. The epithelial chorionic villi throw out during the first three or four months, according to Young who studied this question carefully from about seventy-five histological sections, an enzyme which has the effect of producing first edema, and later on a marked dilatation of the blood-vessels. In fact, this edema may be so marked as to extend throughout the entire body, making that condition which all of us have clinically taken to be some error in the kidney condition, but it has really been due to the enzymes eliminated or produced by the trophoderm layer of the chorion. This produces a marked edema, and with this marked edematous condition of the entire muscle of the uterus we can have a condition that makes for easy stretching or dilatation. Acute dilatation of the heart has been commonly noted, and it has occurred very suddenly under certain conditions of great irritation. I believe that the explanation of these cases is just as has been noted. There has been as a previous discussant has said a marked hemorrhage taking place sufficient to fill the upper part of the uterus, perhaps plugging of the uterine cavity by the fetus taking place in the lower segment, and the tremendous hemorrhage which is there collected causing dilatation of the upper part of the uterus. That is drained away by the time exploration is made but the history has failed to record the hemorrhage, yet the uterus is left in a dilated condition in consequence thereof.

Dr. J. Henry Carstens, Detroit.—We have all probably seen the class of cases under discussion. It seems to me, it is something like Dr. Davis says, we have a uterus that is very firm, but as a result of profound anesthesia there is relaxation of the muscles. It is not that dilatation that we get in the heart muscle where there is something in the heart that can dilate it, but it is simply a relaxation, the muscles are flabby, and when you introduce a sound into the uterus, the muscles not having undergone fatty degeneration or an edematous condition, you simply shove it away up and it seems the uterus is ballooned when it is not. It is of the normal size except that its walls are thin, and you simply push the uterus up because of this flabby condition of the muscle.

Dr. Hugo O. Pantzer, Indianapolis.—There is no doubt that there was nothing but a dilatation in my cases. I was very careful to prod in different directions. I used a curet dull enough not to perforate the uterus, and I could exclude the possibility mentioned by Dr. Carstens. Dr. Carstens has very aptly quoted the heart as a parallel. What is the difference between the heart and uterus? If the heart can dilate suddenly, the uterus can do it. I do not wish to elaborate on my cases at this time but I am absolutely convinced that I did not perforate the corner of the uterus. I went in on the opposite wall and was absolutely sure I had not perforated the uterus before I opened the abdomen and found the perforation. In one case I had an embryo to deal with, and in the other case I had five or six fibroids within the uterine wall. The parallel of the heart is something like that to which I called your attention.

Dr. Edward J. Ill.—Will Dr. Pantzer tell us whether he ever saw a 3-inch heart dilate to 6 inches?

Dr. Pantzer.—Yes, and it could be easily proven.

Dr. Scott (closing).—I wish to express my thanks and interest in the discussion that my paper has elicited. I did not expect such a confirmation as I have heard here. Those who have said they cannot understand the situation, simply have overlooked the possibilities in their cases and have not had it in their minds, if they have seen cases at all. I can readily understand that a practitioner may go through a life time of practice and not run across this kind of thing, and it is not natural for him to understand what he has never seen and what he has grasped as a possibility.

The question of the anesthetic causing this can be excluded. One of these cases I have reported had no anesthetic at any time. The observations were made when the patient was not under an anesthetic. The observation I made twenty-four hours after the first examination was not made under anesthesia, and the condition was there as I reported. There is no doubt that the condition occurs without an anesthetic. The anesthetic is purely incidental in these cases and not causal.

As to whether the condition is brought about by shoving in the instrument, I do not believe that is the explanation, neither do I believe the explanation is due to the uterus being bulged out by the blood that is there. This is a rare condition, and a condition which is due to incoördination.

I have not tried to settle the question in my own mind as to the pathology and etiology of it. I simply report this as a condition that does obtain, and one in which we should have the possibility in our minds, and whenever we think we have a perforation, more examination should be made than has been made in the past.

DR. VAN AMBER BROWN, Detroit.—Was there a marked anemia that antedated the pregnancy in any of your cases? That has been given as one of the causes of this dilatation.

DR. SCOTT.—I would not say that there were not any of them that had anemia. Some of them had no anemia and did not have bleeding sufficient to produce anemia, and some of them were young people. The dilatation occurred in good, healthy subjects, who were not anemic.

SECOND SESSION, SEPTEMBER 17, 1917.

The President, DR. JOHN W. KEEFE, *in the Chair.*

DR. EDGAR A. VANDER VEER, of Albany, read a paper on

CARCINOMA OCCURRING IN THE STUMP OF THE CERVIX, FOLLOWING SUPRAPUBIC HYSTERECTOMY.*

DR. X. O. WERDER, of Pittsburgh, read a paper on

RECURRENCES AFTER "FIVE-YEAR PERIOD" IN CARCINOMA OF THE CERVIX UTERI.†

DISCUSSION ON THE PAPERS OF DRS. VANDER VEER AND WERDER.

DR. J. HENRY CARSTENS, Detroit.—The paper of Dr. Vander Veer has interested me very much although I have been very fortunate never to have had a case of cancer of the cervix in any of my suprapubic hysterectomies. I had one patient who came back and had some discharge and irritation of the cervix. In this case I took the cervix out *per vaginam*, had it examined carefully, but there was nothing malignant about it. Nevertheless for a great many years I had thought of the possibility of cancer of the cervix, and when I find a woman who has a bad laceration of the cervix I do a panhysterectomy.

As to fibroid tumors of the uterus, we may say that almost half of them occur in virgins, with absolutely no diseased condition of the cervix, and certainly there is no need at all of doing a panhysterectomy which, as Dr. Vander Veer says, makes the operation so much more dangerous. In the other cases we can do very often a combined operation, loosen the cervix, tie the uterine arteries from below and finish up the operation from above. Formerly certain operators did vaginal hysterectomy and following the practice of Segond and Richelieu, we did a great many operations for the removal of fibroid tumors by vaginal hysterectomy. This operation can be done easily if there are no complications and adhesions. We can do a morcellement of the uterus and thus avoiding the development of cancer. I do this very often.

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* For original article see page 771.

† For original article see page 776.

So far as Dr. Werder's paper is concerned, as he said, we are never sure of recurrence. I want to call attention to one point he made. Schauta has investigated these cases thoroughly, and in one series of cases I hink he had 10,000 sections made of the glands in the pelvis and the groin, and of the glands in sixty cases postmortem, and he reported quite a number of cases in which there was not a single lymphatic gland involved in cancer in the pelvis, but away up under the kidney or down back of the stomach there were one or two cancer cells found. His investigations show that we can have a cancer of the uterus without any involvement of the glands of the pelvis; but we may have secondary deposits away up near the kidney, the liver, or stomach, and this will lead to these late recurrences.

Dr. Edward A. Weiss, Pittsburgh.—The paper of Dr. Werder deserves very careful consideration. Those members who attended our meetings fifteen or twenty years ago, and who are familiar with the Transactions of the Association, will recall that Dr. Werder has always been one of the warmest advocates of the radical operation for cervical cancer. In 1898 he described the so-called combined operation for cancer of the cervix and presented his paper before this Society. Two years later, Wertheim published practically the same operation. When Wertheim's attention was called to this fact, he wrote Dr. Werder and acknowledged his priority for the operation, but in none of his subsequent writings has Wertheim given Dr. Werder credit.

Dr. Werder was not satisfied with the results of his operation because the mortality was high and the morbidity great, as is generally admitted, and about twelve years ago he began to perform what he now calls igni-extirpation, and the results were most remarkable as compared with those of the old operation, both so far as mortality is concerned and likewise morbidity.

It has been my pleasure to have been associated with him for the last seventeen years, and I am familiar with almost all of the cases on which he has operated, either during the operation or examining the patient subsequently. The difference in the two operations is most striking and decidedly in favor of the igni-extirpation.

In every one of these cases the diagnosis was positive even without the microscope. The macroscopic diagnosis was clear, and in addition every one of the specimens was confirmed by microscopic section, not as we find in some clinics where cases are called cancer and put down in the records as such. The records of Dr. Werder are absolutely correct in every sense of the word. As to those of

Wertheim, I doubt whether the truth has been told at all times. We should give very careful consideration to Dr. Werder's cases as he has reported them, and I think this operation should be called not the igni-extirpation, but rather the Werder operation.

Dr. Condit, East Orange, N. J.—I have just come from a most interesting meeting of the American Electro-therapeutists and Radiologists, held in Atlantic City, in which this whole subject was very much talked about, also the methods of removal of cancer in different parts of the body. Many cases were reported, and it was clearly recognized that the thing to do was to remove the cancer first by surgery, if possible, and then before the wound has healed to apply the Röntgen ray for a certain period of time, and thereby hasten the cure or, at least, prevent metastases.

Dr. Werder (closing).—There is only a word or two I would say in regard to Dr. Vander Veer's paper. Until a few years ago I thought the danger of carcinoma of the cervix following suprapubic hysterectomy for fibroids exaggerated and not of sufficient importance to consider the advisability of the removal of the cervix as a routine procedure. During the last two or three years, however, I have seen four cases in which carcinoma of the cervix followed the removal of the uterus, in some cases, years after the operation. While I still do the suprapubic in spite of this experience, because I consider it a better and safer operation, I precede it by a thorough curetment and after the removal of the uterus, incise it and inspect its cavity thoroughly. In several of these cases I have seen carcinoma present in the uterus, when entirely unsuspected. While this does not do away with the possibility of cancer developing subsequently in the cervix, the preliminary curetment and careful inspection of the uterine cavity minimizes this very greatly.

I have very little to add to what I have said in my paper. I may say here, however, I do not take credit for the operation. It was largely based upon the experience of John Byrne of Brooklyn, who was among the first to do successfully a high amputation of the cervix for carcinoma, and his results excelled those of all his contemporaries using more radical procedures, such as vaginal hysterectomy.

Schroeder, whose clinics I attended many years ago often spoke of a case of a cautery amputation, in which he obtained a permanent cure, while as I recall it, all of his high amputations with the cold knife, subsequently succumbed to the disease. This impressed itself upon my mind, because he evidently attributed some special virtue to the cautery which the cold knife did not possess. It is my opinion, however, that amputation of the cervix by the cautery is not sufficient; to get the best results the whole organ should be removed by the cautery, a procedure which I have practised from the very beginning of my cautery work in carcinoma of the cervix.

Dr. D. C. Moriarta, of Saratoga Springs, read a paper on

FURTHER CLINICAL OBSERVATIONS ON RADIUM.*

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* For original article see page 781.

DISCUSSION.

Dr. William H. Humiston, Cleveland, Ohio.—I have had no personal experience with the use of radium in malignant disease, but I wish to report briefly a case. The patient was a woman, sixty-five years of age, from whom I removed a carcinoma of the breast. After making a cocain injection and taking out a piece of tissue for the pathologist, who reported carcinoma, I made a wide dissection, opened the axilla and cleaned out all the glands. She remained well for four years, then began to complain of difficulty in swallowing, and I referred her to Dr. Iglauer, a throat specialist in Cincinnati. He wrote me that there was a superficial gray deposit on the tonsil of which he was suspicious. He clipped off a little piece and found epithelioma. After the removal of the carcinoma of the breast she remained well for four years, as I have said. He wrote me that he had advised the removal of the tonsil and I immediately wired to the patient to submit to the operation. He removed the tonsil completely. As they were fearful that something might happen to the patient they wrote me in reference to submitting the patient to radium treatment after thorough removal of the tonsil. I told them I had had no experience with radium and referred the patient to Dr. Iglauer, enclosing the letter. Finally, the patient went to Baltimore. She had four applications of radium under so-called competent hands at the expense of $500. She returned home, and within a few months the glands of the neck began to enlarge, and she came to see me again at Cleveland. I referred her then to Dr. Bloodgood, of Johns Hopkins University, Baltimore. He wrote me that it was undoubtedly an extension of the malignant condition of the tonsil, although it was removed early, and advised radical operation. His operation was so extensive that he had to ligate the jugular vein, and as skilful a man as Dr. Bloodgood is it took him nearly four hours to do the operation. He removed everything in that region. He wrote me about the difficulties of the operation, how extensive it was, and so on. She survived the operation, began to get better, and then later returned for two more applications of radium to the other party at Baltimore. This operation seemed successful for a time, but the growth began to appear again and she lived about five months. Certainly this case was taken very early. Dr. Iglauer was very hopeful because only a superficial portion of the tonsil was involved in the epithelioma. She had the radium treatment in skilful hands and she had later an operation by Dr. Bloodgood. Dr. Bloodgood said he had used radium and discontinued its use except in the superficial cancerous conditions, and that after a long experience with it in the deep-seated cancerous conditions, it aggravated and, in his opinion, hastened the growths.

Dr. Thomas B. Noble, Indianapolis.—I have always been somewhat doubtful relative to the curability of carcinoma by *x*-ray, radium, or any occult measure. We are dealing with occultism when we are dealing with these things, and so to be convinced, I took in hand a series of these cases with a gentleman who has radium and who uses it and who makes claims for its use. There were two cases of carcinoma of the neck, such as those that have been described, one of carcinoma of the jaw, three of carcinoma of the upper abdomen, two of the pylorus, one of the gall-bladder in which we opened the abdomen and applied radium direct through tubes in the abdominal wall, two cases of carcinoma of the cervix, and one of the rectum. In none of these cases did we get any results. In two of these cases, especially the case of carcinoma of the neck, I believe that the process was hastened so that while we will have in our reports cases in which hemorrhage and pain and foul stench may be gotten rid of, I look upon these as ameliorations. *X*-ray and radium may have salutary benefits as adjunct measures in therapy, but cannot take the place in any sense of surgery.

Dr. Edward J. Ill, Newark, N. J.—We have heard of two cases with bad results, and I would like to speak of one good result, which is about all the good I have seen from the use of radium. Two years ago last spring I operated on an old lady, seventy-five years of age, for carcinoma of the body of the uterus. During the operation the tissues tore. We infected the left broad ligament with cancerous tissue. In November she came back with a local carcinoma about 2 by 4 cm. in size, I sent her to Dr. Kelly, told him what had happened, and I thought to myself that if he could do anything with that sort of a case with radium it was worth while. He wrote me that he had placed 3400 milligrams of radium into the vagina and had left it in for fourteen hours. She returned to me in a month, and I must say there was not the slightest vestige of carcinoma in the vagina. She has remained well ever since.

Dr. Humiston.—Was it an inflammatory mass?

Dr. Ill.—No, it was carcinoma as shown by the microscope.

Dr. Branham.—Did you make a microscopic examination of the mass?

Dr. Ill.—Yes, and so did Doctor Kelly.

Dr. E. Gustav Zinke, Cincinnati, Ohio.—The use of the cautery, of radium, and of the *x*-ray in the treatment of cancer, has opened up a new and, apparently, great field full of hope and promise for the victims of malignant disease. If we fail to cure or to give relief to-day, it is because these remedies are not yet fully understood and are, therefore, not properly employed. Nor is the character of the cases in which these means are most effective at all clear or defined. The use of these remedies reminds me somewhat of the early use of the obstetric forceps. When Chamberlin tried to sell this instrument, as you may remember, in the various parts of the world, he met with considerable disappointment. At one time he tried to sell it in Paris, and when invited by Mauriceaux to demonstrate the usefulness of his instrument, he was given a case of very narrow and extremely contracted pelvis. Chamberlin failed to deliver the unfortunate patient, who died soon after he ceased his efforts. His forceps were denounced as worse than useless. What of the obstetric forceps to-day? Have we a more useful instrument when it is employed by one who knows how and when to use it?

I have seen the effects of heat, of radium, and of the x-ray in cancer cases followed by decidedly beneficial results, and by an apparently absolute cure in a few instances. My views, as you see, are based entirely upon personal experiences. I am confident that there is great virtue in these three remedies, but we must learn how to use them.

When Kroenig and Gauss, of Freiburg, were over here a few years ago, I listened to both of them very attentively; and, while with them in Chicago I received a message to come home as soon as possible as there was a bad case of carcinoma uteri anxiously awaiting my return. The patient was of magnificent stature, well developed, and apparently in perfect health as far as her outward appearance indicated. An examination, however, revealed the fact that she was hopelessly lost with cancer of the uterus, which had its beginning in the cervix. The whole upper portion of the vagina was filled with a solid mass which extended considerably into the left parametrium. This mass was removed first with the cautery knife, and what remained was treated by the Percy method. The immediate effects in this case were remarkable. The patient suffered no pain after the first application of heat. The Percy method was applied six different times at intervals of ten, fifteen, twenty, and thirty days. After the last treatment nothing more could be seen or felt of the disease. Several weeks after dismissal she complained of an offensive discharge. As there was no visible or tangible evidence of a return of the cancer, I referred her to Dr. Ransohoff for radium treatment for nothing more could be accomplished with the cautery. She received about three or four applications of radium at intervals of a week. The odor promptly disappeared, and the discharge ceased completely. This patient was kept under observation for more than a year and a half. She took her annual trip to the South during the winter, and enjoyed life as much as she had done before. Unfortunately death overtook her at the end of eighteen months after the first operation. There was no recurrence of the disease, either *in loco*, or anywhere else. She died of paralysis due to some obscure lesion within the brain.

Permit me to cite a second case. Two years ago this month, I was called to Cynthiana, Kentucky, to operate on a woman about thirty-eight years of age. She had carcinoma in both breasts. The right gland was still movable. The left side was firmly fixed to the chest wall, had a large crater, and the entire axilla was deeply involved. Both breasts were removed. The right breast was easily taken away, and the wound healed by first intention. The removal of the left breast required an extensive excision of the area around the gland, exposure of the ribs, and the resection of an enormous mass of infiltrated axillary glands, necessitating the removal of both pectoralis major and minor muscles, and a 5-inch exposure of the axillary vessels and nerves.

This case seemed positively hopeless and promised very little or nothing at all. The wound on the left chest could not be approximated and healed very slowly. Eight weeks after the operation, she came to me with all the signs of a recurrence on the left side. The chest showed a large granulating surface, and the arm, from the shoulder down, was intensely swollen and painful. A thorough skin-graft healed the granulating surface very quickly. For the arm, surgery promised nothing. The only hope was the *x*-ray. It was not, in my opinion, a case for radium. To my great surprise, the application of the *x*-ray did wonders for this patient. The induration in the axilla and around the shoulder subsided, the pain ceased, and motion of the joint returned. She is well to this day. There is a woman in the audience at this moment who is well acquainted with this patient, and who can testify as to the truth of my statements.

DR. MORIARTA (closing).—The general practitioner or specialist will never learn the value of radium until he has had some personal observation of its effect. The type represented by the cases of Dr. Noble and Dr. Humiston are the most difficult to treat or do anything for; it is manifestly impossible to control such cancerous condition regardless of the means employed; and I do not think one should attempt to decide concerning the value of radium by the results in such cases. Weir Mitchell once said that he had discovered that it was difficult to cure incurable conditions, and so it is with radium in reference to this type of malignancy.

Those of you who are skeptical in regard to the value of radium should take the first opportunity to personally observe its effect. I have not the temerity to tell you all the things that I am constantly doing with it; it would be asking you to believe too much. My colleagues bring me moribund cases and say to me "if you can relieve this patient, there is something in radium." And when there is a positive betterment they think it is accidental. I do not believe anyone expects to cure these hopeless cases, though the results we are accomplishing in giving them comfort are unique.

I confined my paper entirely to the use of radium in hopeless cases, and feel I am justified from my result in giving them comfort and hope. Take the man with rectal cancer, whose case I reported; he was ostracized from his family, but by the means of radium he was given three months of comfort after his sphincters functionated again. If any of you should have a condition of carcinoma in your immediate family, do not refuse them the comfort from the use of radium because you do not believe in it.

Dr. Noble states that radium may ameliorate the terrible conditions from which these patients suffer. Is that not worth while? What can the surgeon do, after performing an operation, for these patients should there be a recurrence? Absolutely nothing. Invariably these patients become addicted to the use of opium in some form. With radium you will find there will be less occasion for morphia and while there may not be hope for a cure, you will certainly make them more comfortable.

There is something about the action of radium on cancerous tissue which is not uniform, and which I have been unable to fathom. Consequently the prognosis in individual cases is correspondingly uncertain.

DR. W. E. DARNALL, of Atlantic City, read a paper on

MIXED CELL TUMOR OF THE KIDNEY WEIGHING 3 POUNDS IN AN INFANT TEN MONTHS OLD.*

DISCUSSION.

DR. JAMES E. DAVIS, Detroit.—The stigmata of arrested development are from a pathological standpoint very much neglected, and if we had more thorough pathological examinations of postmortem material, I am sure more such cases, or more cases especially of this type, would be discovered. It is not an uncommon thing to find either in the genitourinary or the genital, especially in the kidney, embryonal rests which may for some unknown reason remain for years and years and do no harm whatever, but all at once some condition in the metabolism causes these rests to grow very rapidly, and I am sure that pathologists have found a considerable number of these cases in very young children.

It is indeed very interesting to hear a case discussed so thoroughly from a pathological standpoint, as this one of Dr. Darnall's.

DR. E. GUSTAV ZINKE, Cincinnati, Ohio.—During four and one-half decades engaged in the practice of medicine, I have observed with interest the various hypotheses that were presented from time to time, with reference to the origin of malignant growths in the different structures of the human body. While Dr. Darnall was reading his paper, I was vividly reminded of one of the "old" speculative theories which, at this time, is more or less abandoned, namely, that all cancers are really of embryonal character and origin.

We know that in embryo the body is formed of three distinct layers—the ectoderm, the hypoderm, and the mesoderm. Out of these three layers, each consisting of different cells, are formed the various structures of the body. The outer layer forms the skin, the central nervous system, and all the organs of special senses; the mesoderm builds up the skeleton, the muscles, the glands, and the bloodvessels of the body; while the hypoderm produces all of the mucous membranes. In the building-up process of the magnificent structure of the human body, a so-called induplication of cells occasionally takes place. The embryonic cells, thus rolled up and folded in, are virtually shut off from the rest; they become dormant, as it were; but they are in reality buried and remain inactive and inert for years, and sometimes forever. But in not a few instances, as the result of an accident, a fall, a blow, or constant irritation, they are awakened, become active, and multiply anew and destructively. The result is a malignant growth. If it occurs in the skin or in the mucous membrane, we have an epithelioma; if it occurs in the muscle, it is called a sarcoma; if in the bone, an osteoma, and so on. The description of the case given by Dr. Bloodgood as quoted by the essayist, is really confirmatory of this theory advanced years ago.

DR. GORDON K. DICKINSON, Jersey City, N. J.—Perhaps I ought not to take part in this discussion, but Dr. Zinke's remarks take me back to what he said a little while ago about the Chamberlin forceps, the treatment of carcinoma, and the pathology of carcinoma. Are we not at the portals looking vaguely in? Is cancer produced by irritation? Dr. Carstens very forcibly brought out a year or two ago at a meeting the fact that we have many severe continued irritations that do not produce carcinoma. Theories are proven; hypotheses are speculations. The theory of Cohnheim that it is an arrest of embryonal cells appeals strongly to me, consequently it may be in the near future *one* of the truths which will be proven to be the cause of some kinds of cancer. Irritation, traumatism, may enter the field for another type of carcinoma and likewise the chemical factor.

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* For original article see page 786.

Some time ago a Philadelphia doctor met a man over in Scotland, whose name I think, was Ross. He brought him to Philadelphia and published his investigations. I have his book; I read it, but I do not see much of it quoted. In it he seems to prove or brings out the fact that the death of the tissue is the stimulus for the new formation of tissue. Thus when a person is wounded a process takes place which we call healing, which does not take place when there is no wound because the superficial death liberates xanthine-like substances, which brings about through chemotaxis the process of vascularization. That is just one stage toward cancer. The microscopists tell us that one of the very first things that happens in an early cancer is the liquefaction of the substance between the cells and their liberation, and they are allowed to work wildly. It is a chemical effect. May we not in the cancer matter, as to pathology be stepping ahead a little? We have no right as yet to have a theory; it is all hypothetical, and there may be several types of carcinoma in the future.

DR. DARNALL (closing).—I have nothing more to add except this, that these tumors which have heretofore been known as hypernephroma, or what I have chosen to call a mixed-cell tumor, when found in older persons, mature adults, seem to take more or less the form of carcinoma in contradistinction to the tumors in children, which nearly always take the form of sarcoma.

(To be continued.)

TRANSACTIONS OF THE BROOKLYN GYNECOLOGICAL SOCIETY.

Meeting of May 4, 1917.

The President, DR. CLARENCE R. HYDE, *in the Chair.*

DR. JOSHUA RONSHEIM reported a case of

PREGNANCY COMPLICATED BY A UTERUS DUPLEX UNICOLLIS.

Mrs. S., housewife, aged twenty-six, Russian. Aborted in January, 1916. After curettage the abdomen was opened because of the suspicion that the uterus had been perforated. It was then discovered that she had a double uterus. The last menses appeared July, 1915. The present labor: Labor began at 3.00 A. M., April 25th. I saw her at 10.00 P.M., April 27th, after forty-three hours of labor. The cervix then was effaced and displaced into the left anterior fornix, two fingers dilated, membranes intact, a breech presenting above the brim. Posteriorly and to the right of the cervix was a semisolid mass bulging out the culdesac and obstructing the descent of the presenting part. Abdominal section was done at midnight. The baby weighed 7 pounds 13 ounces. The wall of the pregnant uterus was extremely thin especially at the lower segment; the pregnancy was in the left uterus. The right uterus was enlarged approximately to the size of a six weeks' pregnancy. Recovery has been uneventful. The pregnancy which terminated in abortion was also in the left uterus. At the time of the operation I did not know that she had a double uterus but thought she had a fibroid or an ovarian tumor.

DR. RONSHEIM also reported a case of

OVARIAN CYST POSTPARTUM COMPLICATED BY MECHANICAL ILEUS.

Mrs. Z., housewife, aged twenty-four years, Russian. Chief complaint: abdominal distention. She was delivered of one child day before admission. Immediately after delivery the physician noticed fluid in the abdominal cavity. Labor was normal and about six hours in duration. Distention of abdomen with fluid increased quite rapidly. At 1.00 A. M., ten hours after delivery, she was seen by Dr. Blatteis who sent her to the Jewish Hospital. I saw her at 3.00 A. M. Temperature, pulse and respiration normal. Abdomen markedly distended and bulging in flanks; distinct fluid wave elicited; flatness all over except at the summit where the gut gave tympany. Slight pain and tenderness over the entire right side of the abdomen. At 4.00 P. M. I had Dr. Linder see her; his diagnosis was probable intestinal obstruction. Gastric lavage brought 150 c.c. of greenish fluid from the stomach; an enema gave a good result. At 9.00 P. M. she was having paroxysms of intestinal colic. Temperature 100; white blood cells 17,000; polynuclears 92 per cent. My diagnosis was twisted cyst. At operation a thin-walled right-sided ovarian cyst was found occupying the entire abdomen with the distended stomach and transverse colon lying across it. The cyst weighed 19 pounds, completely filled a solution basin 14 by 7 inches and contained serosanguinous fluid. Recovery has been complete.

DISCUSSION.

DR. JUDD.—I have an indistinct recollection of the first case reported by Dr. Ronsheim. He tells me the history chart states that I curetted the patient. I believed at the time that I had penetrated the uterine wall and opened the abdomen, discovered the condition and described it as a bicornate uterus. I think the interpretation of the doctor might be that my action in closing the abdomen without doing anything would be open to criticism. The depression we would find in the double uterus if not pregnant would not be so deep as when pregnancy was present. The question comes up did I deal with the condition right. If I found a bicornate uterus I would leave it alone. I might have taken off one side and left the other, or leave the condition alone and deal with it by a subsequent Cesarean as had been done. In the second case I do not understand why the doctor had an increase in swelling of the abdomen, as he describes it. The hemorrhage evidently was not sufficient to affect the patient's pulse, and why she should have the distention increase I do not understand. It was evidently a flaccid walled cyst.

DR. SCHWARTZ reported a case of

SEPTIC INFECTION FOLLOWING ABORTION.

The woman denied an induced abortion. She was twenty-six years of age, had been married ten years, this being the fourth pregnancy, her youngest child being two and one-half years old. Her last menses were December 15, 1916. At the time of the miscarriage a physician was called who curetted her, after which she had a chill. This currettage was at 1.00 P. M. At 7.00 or 8.00 P. M. another physician was called in and he called a consultant and immediately proceeded to curet her a second time. This physician told me he merely removed material with his finger. I saw her on the fifth day when she had a temperature of 103° F., pulse 140, and seemed very sick. On admission to the hospital the abdomen was distended and showed signs of fluid. Five days after admission she commenced to bleed and was curetted and packed. On the 25th of January, twenty-two days after admission, we decided to explore and an incision was made in the left inguinal region and 2 gallons of pus was evacuated from the abdomen and a rubber tube inserted. The pus was found to be sterile, and repeated blood cultures were sterile. The temperature ranged from 101° to 104° for several days and she then commenced to complain of pain in the left chest. We aspirated and found about 30 c.c. of clear fluid, sterile. The pulse and temperature still remained up and on the 16th of February we put in a trocar in the left chest and a rubber drain. The pulse then was between 140 and 160. The drain did not act very well and she was again taken to the operating room and an incision made and another rubber drain inserted. The temperature and pulse still remained high. An *x*-ray was taken of the chest and a diagnosis of lung abscess was made. A thoracostomy was done and the lung drained. Immediately there was a marked improvement. The pulse is now 100 to 108, the abdominal wound still open and draining pus. Repeated blood cultures are negative. The reason for the incision in the left inguinal region and not in the median line was that it was thought the condition might be extraperitoneal.

DISCUSSION.

DR. GIBSON.—These metastatic infections are very interesting. We have two cases of this type in the Long Island College Hospital at the present time. One of these was delivered of a dead baby by a midwife six weeks ago. Three days after her confinement she was admitted with an acute parametritis which gradually subsided and we thought she was getting well when she developed an area of acute osteomyelitis of the costochondral junction of the right ninth rib which required curettage and drainage. The second case is one of acute parametritis which was improving when she suddenly developed an infection of the right kidney. Last year, at St. Peter's, we had a metastatic infection of the right pleural cavity following a puerperal infection, but without lung abscess as in the case reported by Dr. Schwartz.

DR. ROBERTSON.—I should like to ask if the cultures made from the fluids were anaerobic. In laboratory work we would often find the cultures sterile if grown under aerobic conditions. I have seen a case of pleurisy under similar conditions but found it to be a simple pleurisy with effusion; the case proved fatal. I have seen a septic abdomen, one last year, an Italian woman, which was opened by a central incision and drained of a large amount of pus. We found it advisable to open in both flanks later and the temperature dropped. The amount of pus was very large; every time she moved the pus would run out of the openings, as though out of a barrel; she made a good recovery.

DR. SCHWARTZ.—I do not believe any anerobic cultures were made.

DR. JUDD presented a specimen of

URETERAL CALCULUS.

This specimen of ureteral stone I removed *per vaginam*. It is of no particular interest except on account of the method of removal. In the gradual development of my work in palpating ureters I have tried to make it practical. The last stone I removed previous to this by section was rather low down in the pelvis and I said then if I had one low down to operate upon again I would certainly dissect it out below, *per vaginam*. In this case I found no special difficulty, I did it with the patient in the reversed Sims's position. This stone was in the left ureter and I operated with the patient on the right position in order to have the pool of blood away from my field of operation. I split the vaginal wall transversely to the broad ligament, picked up the ureter and split it lengthwise, and the stone fell out. Much to the disgust of some of the gentlemen present I sewed the ureter up. Twenty-four hours afterward the woman hardly knew she had been operated upon.

DISCUSSION.

DR. POLAK.—A point of technic which has given me a great deal of satisfaction in removing stone is to run a piece of silk suture around the ureter and bringing the ureter down in this way, makes it more steady with less danger than by the use of hooks.

DR. GIBSON.—I saw a case several years ago where just the traction damaged the ureter, and I believe the silk a most important part of the technic.

DR. JOSHUA RONSHEIM read a paper entitled

PREGNANCY AND LABOR FOLLOWING OPERATIVE PROCEDURES ON THE GENITAL TRACT.*

DISCUSSION.

DR. POLAK.—The doctor's paper seems to me to be extremely timely and a paper that should go out to the general practitioner and occasional surgeon to be digested by them as well as by us. Many of us fail to appreciate the truth of what the doctor has said. Even now it is not exceptional to go into almost any general hospital clinic and see surgeon's do suspensions and fixations, although we see such reports as Dr. Ronsheim's and Dr. Crane's, and one would think that they would have some weight tending to show that dystocia is produced by many of the operations. In regard to pelvic repair and its subsequent effect on pregnancy we have for a long time been teaching our patients that they should come back to the hospital for delivery and we have delivered a large number and I agree with the doctor that a perineotomy will save the structures. We have found that a lateral incision is better than a perineotomy. One point is that these patients do not bear operative deliveries well; spontaneous deliveries do not produce as much devastation of the tissues. The Emmet operation or its modifications are almost invariably followed by relaceration. On the other hand amputations if not done too high go through without injury. In shortening of the round ligaments it is interesting to note their influence on subsequent pregnancies. I am convinced that the one operation that stands the test of pregnancy best is the Webster-

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* For original article see page 289, August, 1917.

Baldy operation. The Gilliam operation has not caused complications in labor, as the doctor notes in his paper, but the patients have a retroposited uterus in a large number of cases. The Coffey operation is disappointing. My last case was a woman with myoma of the uterus and the operation we used to cover the raw surfaces was the Coffey. She subsequently married and went through pregnancy to the last few months when I thought the scar had given way. The acute symptoms quieted down and labor commenced but there was no progress. We opened the abdomen and we found that two loops of the ileum had become attached to the Coffey operation. The Coffey operation had given way and the broad ligaments had slid and these two loops had slid with it and as a consequence she had acute angulations one above the other. Section was done and she recovered. I cannot impress the fact enough, that when a woman's abdomen has been opened for any cause she is afterward liable to have a complicated labor and should be watched. These points the doctor has brought out vividly and they should be kept in mind by men doing this work.

DR. GIBSON.—In regard to the criticism of the Baldwin operation, I want to say that if the band had been cut early in the labor there would have been no difficulty. I know of three cases in which this has been done and in two of them it was sutured together again immediately with no return of the prolapse. I have always believed that when it was possible to overcome the eversion of a lacerated cervix in a woman still in the child-bearing period who really needs an operation by doing a unilateral trachelorrhaphy that the other side should not be touched. Why put a scar where no scar existed? A cervix which has been so repaired will very often dilate, if given time, while one which has been repaired on both sides will invariably tear again and often more extensively than before. I hold no brief for ventro-suspension but I know of many cases which have been successfully delivered after ventro-suspension and I have always thought that the cases which had dystocia were those in which the sutures were placed low on the posterior surface of the uterus or had adhesions as the result of infection at the time of the operation.

DR. RONSHEIM.—I fully agree with Dr. Gibson as to the necessity for cutting the band in the Baldwin operation. I did so the moment I saw this case. Unfortunately I was called when it was too late.

DR. LEO SCHWARTZ read a paper entitled

PAPILLOMATOUS CYSTS OF THE OVARY.*

DISCUSSION.

DR. EMIL SCHWARTZ.—The points made by the doctor in his paper hold good for practically all the cases of papillary tumors. The theories however, which he mentioned, for the sake of completeness, are mostly incorrect. Serous papillary cysts are doubtlessly derived from the germinal epithelium. Any experienced observer is able to demonstrate all the stages of their genesis from simple pocketings of the surface epithelium to the large papillary cysts occurring so frequently on both sides of the uterus. The histogenesis of pseudomucinous papillary tumors is in general expressed by two theories. Ribbert's theory which derives from one-sided developed teratomata, and Gebhardt's and others theory which declare that the pseudomucinous originate from the oval follicle. The first is very improbable, the second is not proven. The rapid degeneration of the papillations and the lime salts concretions deposited in place of the degenerated papillations indicate the short life of the tumor elements. As other instances show the lime salts deposits require a good blood supply. This might explain the improvement and apparent cures of cases of metastasizing papillary tumors by simple laparotomy and drainage. The cases of serous papillary cystomata occur largely in young women mostly between ten and thirty years of age, which is a prognostic hint as regards the benignity of the tumors.

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* For original article see December, 1917, issue.

Dr. Polak.—I have nothing to add to what Dr. Schwartz says, he has included all I know about the condition. These cases are interesting to me, particularly as they all seem so hopeless to the surgeon as he opens the abdomen. One of the cases mentioned by the doctor was a woman I had seen some months before and advised her to come into the hospital. She delayed but finally came. She had implantations all over the tissues yet removal and drainage cured her absolutely. Another case of seven years standing was a woman who had numerous implantations and with all the features of malignancy, yet the Mickulicz drain saved her life. It is interesting to know that by the increased blood supply due to the placing of the drain that calcareous changes occur and through this process they become nonmalignant, surgically.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Modifications of the Antitryptic Power of Blood Serum in the Pregnant Woman.—G. Ecalle (*Archives mensuelles d'obstetrique et de gynécologie*, 1917, vi, p. 97) sums up his extensive study as follows: The antitryptic power of the serum increases during gestation and it appears to increase from the debut of pregnancy until toward the sixth month. After the point of maximum increase the gain appears to be held at an almost constant level throughout gestation inclusive of the first days postpartum. A progressive decrease is in evidence in the second postpartum week. The antitryptic power of the serum appears to be augmented in gestation accompanied by accidents of the toxemia of pregnancy. The determination of the antitryptic power, however interesting it may be *per se*, can have no diagnostic value in a case of doubtful pregnancy in the absence of other positive evidences. The increase in the antitryptic index in the gravida appears to be due, first, to the penetration into the maternal blood of tryptic ferments contained in the placenta, and second, to the presence in the maternal blood of the proteolytic antiplacental ferments described by Abderhalden.

Pharmacological and Clinical Investigations into the Action of Erodium Cicutuarium, a Hemostatic in Uterine Hemorrhages.—Van Dongen of Professor Treubs' Amsterdam clinic (*Archives mensruelles d'obstetrique et de gynécologie*, 1917, vi, 169) has endeavored to find a substitute for hydrastis canadensis—the price of which has now become almost prohibitive—as a hemostatic in meno- and metrorrhagia. He states that hydrastis is no longer cultivated and will soon become extinct. *Erodium cicutarium*, which suggested itself to the author was first recommended in uterine hemostasis about a score of years ago. In the laboratory it was studied in comparison with that of hydrastis and ergot and upon cats, chiefly nonpregnant, with the view of determining its action in the production of uterine contractions. It was ascertained that the drug acted wholly upon the musculature proper of the uterus, sparing the muscle coats of the arteries. It having been learned that *erodium* was nontoxic it was tested in the clinic on 118 miscellaneous cases of meno- and metrorrhagia. The usual dosage was twenty-five drops of the fluid extract four times daily. The results show much variation but the author reports that the new drug excels all others in use in hemorrhages (menorrhagia) in virgins and has a dependable action in other cases, equal in fact to that of hydrastis and its derivatives. In nonselected cases a comparison shows that erodium is certainly not inferior to hydrastis as a uterine hemostatic. [NOTE: *Erodium cicutarium*, which belongs to the geranium family, is known in this country as the common Storksbill. Introduced originally from Europe it is said to grow luxuriantly in Texas and California. ED.]

Transplantation of Ectopic Pregnancy from Fallopian Tube to Cavity of Uterus.—The patient of C. J. Wallace (*Surg., Gyn. and Obst.*, 1917, xxiv, 578) was operated on for fibroid and when the abdomen was opened an ectopic gestation was found in the left tube at the outer part of the isthmus. The tube was very soft and healthy, enlarged to the size of a walnut but not distended. The fibroid, about the size of a large hen's egg, extended into the uterine cavity. To remove it, a clean cut incision was made encircling the tumor and entering the cavity of the uterus down to and involving the inner os. The gestation sac was dissected out intact including part of the tube-wall. It was in size about equal to a large olive. It was at once placed within the cavity of the opened uterus and caught by two of the sutures of the inner row of plain No. 1 catgut used in closing the wound in the uterus. The tube was closed in like manner and left in place. The patient left the hospital on the fourteenth day after a complete recovery. The pregnancy went on normally to full term and resulted in the natural birth of a fully developed child. No doubt the raw surface of the edges of the wound in the uterus was instrumental in the perfect attachment of the transplant.

Nitrous Oxide-oxygen Analgesia and Anesthesia in Obstetrics.—In advocating the use of nitrous oxide-oxygen analgesia and anesthesia in obstetrics, G. C. Copeland (*Can. Med. Assoc. Jour.*, 1917, vii, 405) says that if the baby is blue, asphyxiated, shocked, or apneic at birth, one should turn on full oxygen to the mother, turn the baby upside down, and clear the throat of mucus, liquor amnii, blood, etc. If the baby's heart is beating, however feebly, and the placenta attached to the uterus, barring fatal injuries to the head, the baby will in all probability speedily revive. In all forceps cases, between periods of pulling, give the mother an excess of oxygen regardless of the kind of anesthetic. Thus the baby will have an excess of oxygen in its brain to carry it over the period of compression when the cranial circulation has nearly ceased. In cases of placenta previa and abruptio placentæ partialis as soon as any separation and hemorrhage takes place, oxygen is valuable. In breech immediately before attempting the extraction of the thorax and head, free the cord, saturate the baby with oxygen through the mother, and the vital three or four minutes may be very shortly prolonged with hope of a living child, that otherwise might be lost. In eclampsia not only is nitrous oxide the least damaging, but oxygen being deficient any way, is specially necessary. In abdominal Cesarean section, just before opening the uterus, flood the mother with oxygen, even if giving ether, and the baby will likely survive, if viable. In any labor, should the child's life become endangered, as proven by tumultuous movements, failing fetal heart sounds, eclampsia, long pressure, etc., give the mother oxygen freely, regardless of the kind of anesthetic used.

Action of Pituitrin on the Surviving Human Uterus.—F. J. Chartevis (*Glasgow Med. Jour.*, Feb., 1917, 65) has repeated Lieb's work on the human uterus, using a thin strip of uterine tissue about 1 inch in length and about 1/8 inch in thickness and width. Lieb found that pituitrin has a very prompt and marked effect upon the human pregnant uterus, increasing the rate of contraction and the tonus. In the nonpregnant uterus he made the observation that pituitrin in small doses had no action, and in large doses may produce a very definite depression. The writer s material included nonpregnant tissue, tissue removed after early abortion, and tissue removed by Cesarean section at full time. He found no essential difference in the response to pituitrin in the pregnant and nonpregnant human tissue. Both responded promptly to pituitrin by an increased activity.

Status of Pituitary Extract in Labor.—J. J. Trundell (*Jour. A. M. A.*, 1917, lxviii, 1601) supplementing a previous review of 3952 cases in which pituitary extract had been used with one maternal death in 565 cases and one fetal death in 146 cases, has collected reports on 1293 additional cases, making a total of 5245 cases. Among these 1293 cases, uterine rupture occurred once in every 106 cases, fetal death once in every 38 cases, and asphyxia pallida once in every 32. The author concludes that on account of its undoubted bad effects on the child and in a lesser degree on the mother the field of usefulness of pituitary extract is limited.

W. Wertenbaker (*Jour. A. M. A.*, 1917, lxviii, 1612) records two cases of spontaneous rupture of the uterus in multiparæ following the administration of a single dose of pituitary solution.

Measles Contracted in Utero.—In the case reported by D. P. Kincaid (*Memph. Med. Month.*, 1917, xxxviii, 86) about five and a half hours after delivery a measles eruption appeared simultaneously on mother and child. There had been an epidemic of measles in the institution for several weeks and it is evident that this case is one primarily of parental infection transmitted to the fetus in utero.

Radiumtherapy in Cancer of the Uterus.—Recasens (*Archives mensuelles d'obstetrique et de gynécologie*, 1917, vi, p. 34) of Madrid reports statistics concerning 239 cases of cancer of the uterus seen during 1914–1916 in which radium with or without x-rays was used after or as a substitute for the knife. Of this number 69 patients are dead, 14 are living with metastases and 32 are still under treatment. The number of clinical cures is set down as 122 (there is a discrepancy of 2 in these figures). The author claims 16 cures and no failures in operable cases of cancer of the cervix. Of 16 patients with cancer of the corpus 6 are dead and 2 still under treatment. In 5 cases radiation was used after hysterectomy; 2 patients are dead and 1 has metastases. The main material consists of 202 cases of inoperable cancer of the cervix, in 104 of which a clinical cure has been obtained. The author's convictions are even stronger than his figures, for he believes that 70 per cent. and even more cases of inoperable cancer of the cervix can be thus arrested.

Observations on the Degeneration of Leukocytes in the Urine as a Diagnostic Aid in Tuberculosis of the Urinary Tract in Women.—H. M. N. Wynne (*Johns Hopkins Hospital Bulletin*, 1917, xxviii, 251) tabulates twelve cases of nephrectomy for renal tuberculosis, in at least half of which a majority of the urine leukocytes showed marked degeneration. From another table of eighteen operative cases of miscellaneous nontuberculous diseases of the urinary apparatus the leukocytes showed a very slight tendency to degeneration. Finally in a third table of nineteen nonoperative nontuberculous cases there was no tendency whatever to degeneration of these bodies. But since marked degeneration has been seen rarely in nontuberculous cases (acute pyelitis) while it sometimes fails in renal tuberculosis this symptom can have no pathognomonic value although extremely suggestive of the latter malady.

Fatty Tumors of the Uterus.—C. W. W. ELKIN and S. R. HAYTHORN (*Surg., Gyn. and Obst.*, July, 1917) report a case of this very rare neoplasm of which only fourteen unquestioned instances are noted in the literature, the origin and classification of which are still uncertain. Their own case related to a colored woman, forty-six years of age, who presented weakly vaginal hemorrhages for about four years and a gradual enlargement of the abdomen. Abdominal hysterectomy was done for a supposed fibroid and examination of the specimen showed a large proportion of fatty tissue. In a discussion on the histogenesis of these tumors the authors conclude that the fat cells are derived from the connective-tissue by a process of fatty infiltration. They base this theory on the following points: (1) Identified connective-tissue cells with typical fibrils were so closely associated with the fat cells that one hesitated to differentiate between them. (2) Infiltration of many cells by fat globules is a recognized process to which connective-tissue cells are not known to be immune. (3) The age of the patients from whom such tumors have been taken is rather beyond the usual time for the development of congenital tumors.

The following conclusions were arrived at from a study of their own specimen and the others noted in the literature, namely, that fatty tumors of the uterus come from one of two sources; either lipoblastic displacements or connective-tissue cells which have undergone fatty infiltration. The lipoblastic displacement theory seems to offer the best explanation of the findings and that these growths belong to the class of "simple tumors." They believe that it should therefore be called a lipoblastoma uteri.

Desiccated Placenta in the Vomiting of Pregnancy.—E. Cary (*Surg., Gyn. and Obst.*, August, 1917) has employed the desiccated placenta in 5-grain doses three times daily in thirteen cases of vomiting in pregnancy, in seven of which the vomiting stopped within a day or two; two improved, two were lost sight of and in two the results were not satisfactory. The author's reasons for giving this substance were as follows: (1) If the condition is due to a lowered immunity of the host to the growth of the syncytium, as seems probable by the work of Acconci, it may stimulate by acting as an antigen. The work of Curtis would also bear this out. (2) If the proteolytic ferment is lower than normal, as demonstrated by the negative Abderhalden reaction, it may increase the ferment content of the blood. (3) The placenta may be a gland of internal secretion, and it may increase the action of the thyroid and adrenals, and by so doing hasten the oxidation of partial protein, split-products being thrown into the circulation.

Study of Fetal Maturity in Utero.—Charles B. Reed (*Surg., Gyn. and Obst.*, August, 1917) presents a study based on 100 cases for determining when fetal maturity has been reached in any particular instance. The approximate standards of size and age were as follows: The length of the child in utero should verge upon 50 centimeters, the duration of the pregnancy as determined by careful measurements of the uterus rather than by the lapse of time since the last period and by the size of the fetal head, which should measure from 8.5 to 10 centimeters in the biparietal, and from 10 centimeters to 12 centimeters in the occipitofrontal diameters. The methods developed by Ahlfeld, McDonald and Perret were employed for the purpose and the writer believes that in these procedures a means of obtaining with reasonable accuracy a knowledge as to the proximity of fetal maturity and even as to the existence of postmaturity is at hand. He found the Ahlfeld procedure practically correct in 61 per cent. and the McDonald method in 51 per cent. of the cases. By the Perret method the normal biparietal diameter may be secured with accuracy in from 68 per cent. to 94 per cent. of the cases. The author believes that these procedures are entitled to wider employment and more confidence than they have hitherto received and that they should be regularly practised as well as taught in the schools. The author also believes that mere fat deposit in many cases is not so much a sign of fetal maturity as of over long detention in the uterus.

Indication for Symphysiotomy Antepartum.—Fieux (*Annales de gynécologie et d'ostetrique* 1917, xlii, 518) reports six cases of this intervention, summed up as follows: A woman in her fourth pregnancy was enabled to give birth to a living infant weighing 3260 grams. Her three earlier labors had all terminated in forceps extraction with dead children. A second woman had a similar history, her third child having been born alive after symphysiotomy. A third mother lost here third child after a technically successful symphysiotomy, its death two days postpartum having been attributed to unsuccessful attempts at forceps extraction. A fourth woman had the same kind of ill fortune. In a fifth case the conditions and results were the same as in Cases I and II. In the sixth woman the first and second labors ended in the premature expulsion of syphilitic fetuses. Two normal children with labor at term were lost after unsuccessful attempts at forceps extraction. The fifth labor after symphysiotomy ended in the birth of a living child which thrived. In this case alone was the expulsion spontaneous.

Such results in the author's opinion justify the revival of symphysiotomy in selected cases at the expense of Cesarean section. After the latter the reproductive system is impaired as a unit, while the former actually improves the state of the birth tract, provided the fetus is too greatly developed for expulsion in a simple flat pelvis with a true conjugate of 8 to 9 centimeters. The author who does not care to speak in millimeters, regards symphysiotomy almost as the indication of necessity in these pelves and in the absence of all complications. Performed under these circumstances we get a separation of about 4 or 5 centimeters without any prejudice to the sacroiliac joints, with reduction of injury of the soft parts to a minimum. An underlying principle of the authors operation is to dissociate entirely the intervention and the act of parturition. Performed long in advance of the latter it is as simple as a tenotomy.

ITEM.

To Officers of the Medical Reserve Corps U. S. Army Inactive List.

Word received from the Surgeon General of the U. S. Army, conveys the information to officers of the Medical Reserve Corps of the United States Army, inactive list, that assignment to active duty may be delayed, and that they are advised to continue their civilian activities, pending receipt of orders. They will be given at least fifteen days notice when services are required.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATION.

PRIMARY CARCINOMA OF THE LIVER IN CHILDHOOD WITH REPORT OF A CASE.

BY
JONATHAN FORMAN, M. D.,
Columbus, Ohio.
AND
JOHN S. HATTERY, M. D.,
Mansfield, Ohio.

(With two illustrations.)

PRIMARY carcinomata of the liver occurring at any age have been so infrequently reported that their practical interest is still somewhat limited. According to Winternitz(1) they are found in from 0.028 per cent. to 0.3 per cent. of all autopsies. White(2) whose observations covered eleven such specimens obtained from 11,500 autopsies has estimated the proportion of undoubted primary to secondary carcinomas of the liver to be as 1:25.

Primary carcinomata of the liver in childhood are especially interesting. According to Wells(3) a relatively large proportion of tumors occurring in young people are primary carcinomas of the liver. Castle(4) was able to collect from the literature forty-one cases of primary carcinomas of the liver occurring in individuals under sixteen years of age. To these he added one case. Since the appearance of this collection, Freeman(5) and Griffth(6) have each reported a case.

CASE REPORT.—A boy aged three years. Family history is negative for cancer. One year ago the patient began to have attacks of abdominal distention and pain. These attacks grew progressively more severe and were at times accompanied by jaundice. Three weeks before his death the patient fell and received a blow upon the upper abdomen. This accident was promptly followed by an attack of abdominal pain, distention, jaundice, and a temperature of 101° F. accompanied by vomiting. There was at this time edema of both extremities. The liver was enlarged to the size shown in Fig. 1. The jaundice persisted throughout the last three weeks of the patient's life. During this same time there occurred a loss of 20 pounds.

Autopsy by Dr. J. S. Hattery and Dr. R. V. Meyers.—Blood tinged fluid (300 c.c.) in the left pleural cavity; vegetations on the mitral valve of the heart; adhesions about the vermiform appendix; 200 c.c. of clear fluid in the abdominal cavity; spleen slightly enlarged and congested; gall-bladder distended on account of a stenosis of the common bile duct; mesenteric lymph nodes enlarged; cancer of the liver.

The liver is greatly enlarged, with an uneven, nodular surface. These nodules stud the entire surface of the organ and are white and umbilicated. They vary greatly in size. Upon section the liver cuts with resistance and presents a surface filled with nodules similiar to those seen on the outer surface. Some of these exhibit degenerated centers.

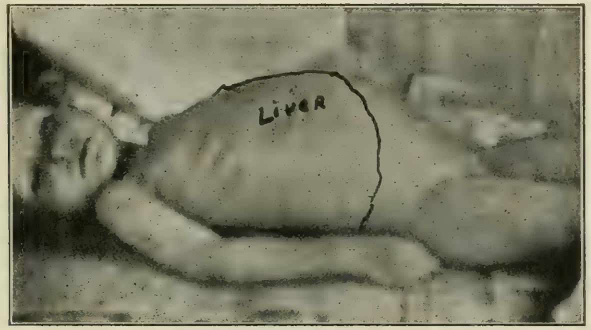

FIG. 1.—Showing outline of liver dullness.

Microscopical examination reveals tumor nodules composed of epithelial cells which are, for the most part, spheroidal or polyhedral in shape. While they resemble the liver cells, they are somewhat smaller and do not take as distinct a stain with the eosin as do the normal cells. The cytoplasm of the tumor cells is distinctly granular. Their nuclei are centrally placed and vesicular in character. The amount of chromatin, however, varies considerably with the individual cells. Mitotic figures are seen in every section studied. In a general way, the tumor cells are arranged in columns resting upon a capillary stroma similar to those seen in the normal liver parenchyma. In some areas, the proliferation of tumor cells is so marked as to bring about a peritheliomatous arrangement. The cells become elongated and arrange themselves radially about a central lumen. In such areas and in the larger nodules, necrosis is frequently encountered.

The enlargement of the mesenteric lymph nodes is not due to an infiltration of tumor cells but to the filling of the lymph sinuses with fluid and a proliferation of the reticulo-endothelial cells.

Discussion.—This case presents most of the typical symptoms as summarized by Castle:

1. Cachexia, anemia,
2. Gastric or right hypochrondriac pain,
3. Tumor in the abdomen,
4. Icterus when the bile ducts are occluded,
5. Ascites when the portal or lymphatic obstruction occurs,
6. Terminal fever.

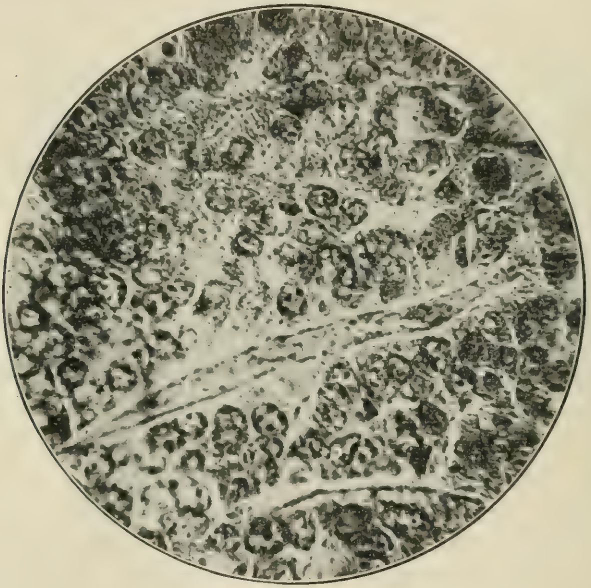

FIG. 2.

The tumor falls into the class of primary parenchymatous carcinomata of the liver which have been reported as occurring in children even younger than this patient. They are usually regarded as congenital.

Carcinoma of the liver may arise from the bile duct epithelium or from the liver cells themselves. The carcinoma cholangiocellulare has a tubulo-adenomatous structure with a liberal amount of stroma. The carcinoma hepaticellulare has a trabecular structure.

The presence of more than one tumor nodule is best explained as intrahepatic metastasis and not as an example of mutiple primary tumors. Attention has frequently been called to the absence of extrahepatic metastases in cancer of the liver. This specimen serves to emphasize this point.

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BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Diagnosis and Serum Treatment of Anterior Policmyelitis.—A. Zingher (*Jour. A. M. A.*, 1917, lxviii, 817) states that the injection of immune and of normal human serum into the spinal canal during the acute febrile stage of poliomyelitis causes a distinct cellular reaction which is mostly polynuclear in type. The phagocytic action of these cells is beneficial in poliomyelitis. Such action is enhanced in immune serum by the presence of specific antibodies. It is preferable to use fresh serum, or serum which has been obtained under sterile precautions, passed through a Berkefeld filter and bottled without the addition of a preservative. The presence of a preservative and of hemoglobin in serum enhances its irritating effect, and gives rise to the more severe types of reaction. For purposes of treatment, it is important to diagnose the cases during the preparalytic stage of the disease by the typical group of early symptoms and the changes in the spinal fluid. These symptoms are fever, slight rigidity of the neck, jerky movements and fine tremors of fingers and hands. The diagnosis of poliomyelitis can generally be confirmed in the early stages of the disease by a bed-side examination of the spinal fluid which shows macroscopically the ground-glass appearance and a positive foam test. The laboratory examination will show an increased number of lymphocytes, an increased amount of albumin and globulin, and a marked reduction of Fehling's solution. Parents should be instructed to recognize the early symptoms so as to notify promptly the family physician. This is especially important in detecting secondary cases in the same family.

Bacteriology and Probable Means of Spread of Poliomyelitis.—H. Greeley (*L. I. Med. Jour.*, 1917, xi, 138) says it has been demonstrated that the organism isolated from the nerve centers of cases of poliomyelitis (including the "streptococcus" described by Rosenow and others) is a pleomorphic bacillus of the distemper group, which varies in characteristics much as the various, supposedly different, members of the group do from one another; that this poliomyelitis bacillus could cause paralysis in cats, rabbits and guinea pigs, and that an accidental passage of a culture through man may gave rise to abortive symptoms of the malady; that after this last named passage it could produce paralysis in a rabbit, and a contagious infection of guinea pigs with nerve center lesions; and, finally, that from the guinea pigs it (the same bacillus) could produce distemper in cats. It is shown that the organism is saprophytic and grows well in milk at "summer heat"; and that it resists the pasteurization process, while contained therein. Also, that it forms spores, and is a "filter passer." Finally, it seems certain that, while contact cases of poliomyelitis may occur, either by direct transmission of the germ from animal to man, or from man to man, the great mass of cases which comprise epidemics are most probably caused by milk borne contagion, and it seems probable that we shall have to question our cows as possible "carriers" of the infection, although, it is, of course, evident that infection could get into milk from other animals, as the cat and dog, or even man.

The same writer (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 540) subsequently states that by a series of serum reactions he has shown the ultimate relationship of this organism to that of dog-distemper.

The Fourth (Duke's) Disease.—Lesage (*La Presse Medicale*, 1917, xxv, 401) apparently regards it as very difficult either to prove or disprove the autonomy of this clinical affection in the absence of knowledge of its living cause and its artificial transmission. There is a "symptomatic scarlatina," or scarlatinette, which occurs in epidemic incidence, yet is devoid of any vital element of true scarlatina save the rash itself. During the past half score of years the author has seen many cases in which scarlatina and scarlatiniform rubeola could with certainty be excluded, yet he cannot claim that all of these cases represented Duke's disease. From the epidemiological viewpoint these cases were uniformly benign and uncomplicated and always of the same clinical type with incubation period of 2 weeks. Contagion was feebly present, several children in a family being attacked with sparing of infants at the breast. From the clinical side fever is of the one day type (save when a second rash follows the first), and the scarlatinoid rash is mild and never itches. Practically every organ and tissue in the body, save the skin, is spared, and the attack never lasts over a week.

Butyric Dyspepsia, Mucous Gastritis and Pylorospasm in the Nursling.—Chevrel (*Le Progrès Medical*, 1917, xlv, 242) basing his study largely upon article published in 1911 by Barbier and Cheinisse and personal experience with a single case concludes that there occurs in nurslings dyspeptic phenomena which are evolved under the masque of stenosis of the pylorus; that these dyspeptic phenomena are in general connected with a defective alimentation over rich in fats; that the symptoms improve and vanish if the latter are diminished or suppressed outright in the diet, and that gastric lavage may act very favorably in these cases, especially when, as in the author's experience, mucous gastritis is also present.

The Recent Epidemic of Infantile Paralysis.—In the summer and autumn of 1916 there were 24,000 cases of infantile paralysis in the United States. Eighteen thousand of these were in New York City and the adjacent territory. Discussing these, Haven Emerson (*Bull. Johns Hopk. Hosp.*, 1917, xxxiii, 131) says that the distribution was independent of sanitary conditions and that the cases were most frequent in proportion to the population in the parts of the city where congestion was least. The mortality was much higher than formerly quoted. In the city as a whole it was 26.96 per cent. The preventive measures suggested were similar to those given in Osler, the additional advice being given that children should avoid eating uncooked fruit throughout the summer. The longer the cases remained in the hospitals and the more the neurologists and orthopedic surgeons studied them, the longer did they postpone any attempt at interference by massage, electricity, or mechanical contrivances on the affected muscles of extremities. The muscles are essentially fatigued and must be rested a long time. The best summary of the situation is the report prepared with the approval of the Public Health Association. This report defines the specific cause of poliomyelitis as a microörganism which may be positively identified at present only by its production of poliomyelitis in monkeys experimentally inoculated. This virus is present in the nervous tissues and certain other organs of persons who have died of poliomyelitis, also in the nose, mouth and bowel discharges of patients suffering from the disease. Healthy associates of poliomyelitis cases may harbor the virus in their noses and throats. These experiments, together with the fact that monkeys have been infected by direct application of the virus to the mucous membrane of the nose and by feeding of the virus, are strong evidence that in nature infection may be directly spread from person to person. Healthy carriers of the virus and undetected cases are probably considerably more numerous than frankly paralyzed cases. Some insect or animal host, as yet unrecognized, may be a necessary factor in the spread of poliomyelitis, but specific evidence to this effect is lacking, and the weight of present opinion inclines to the view that poliomyelitis is exclusively a human disease and is spread by personal contact, whatever other causes may be found to contribute to its spread. Personal contact includes all the usual opportunities for the transference of body discharges from person to person, having in mind as a possibility that the infection may occur through contaminated food. The incubation period in human beings is probably less than two weeks, and in the great majority of cases, between three and eight days. If the foregoing conception of the disease is correct, it is obvious that effective preventive measures approaching complete control are impracticable, because isolation of recognized cases of the disease and restraint upon their immediate associates must fail to prevent the spread of infection by unrecognized cases of carriers. Of first importance is the more general recognition by practitioners of nonparalytic cases through clinical observation and laboratory procedures. Lumbar puncture has been shown to offer valuable aid in diagnosis. At present our information demands: 1. That all recognized and suspected cases be promptly reported. 2. Isolation of patients in screened premises for an arbitrary period of six weeks. 3. Disinfection of all body discharges. 4. Restriction of the movements of intimate associates of the patient so far as practicable. This should include at least exclusion of the children of the family from schools and other gatherings. 5. Protection of children so far as possible from contact with other children or with the general public during epidemics. 6. Observations of contacts for two weeks after the last exposure. There is no specific treatment of established value in poliomyelitis. During the persistence of the acute symptoms of the disease, the important principles of treatment are rest in bed, symptomatic relief, and passive support for the prevention of deformities. Active measures during this stage are not only useless but are apt to cause serious and often permanent injury. Hospitalization of patients where possible is to be encouraged. The best chances of recovery from residual paralysis demand skilful after-care, often long continued, and always under the direction of a physician familiar with the neurological and orthopedic principles of treatment.

Acute Poliomyelitis.—F. W. Peabody (*Bost. Med. & Surg. Jour.*, 1917, clxxvi, 637) reports the work of the Harvard Infantile Paralysis Commission in 1916 in the early diagnosis of the disease, by means of the examination of the spinal fluid, and the preparation and administration of immune serum. This was obtained from persons who had passed through the acute attack of the disease from three to forty years ago. Of the 123 cases of poliomyelitis seen, 54 were first visited in the preparalytic stage, 65 were recently paralyzed cases, and 4 were cases of old paralysis. Of the total of 54 preparalytic cases seen, 51 were treated with immune serum. The results of treatment in the cases seen in the preparalytic stage of the disease are rather encouraging. The mortality was 10 per cent., which is only one-half of the general mortality of the epidemic. The majority of the fatal cases were acute fulminating instances of the disease and it is hardly conceivable that any method of treatment could have been of value. Only 21 per cent. of the cases (excluding the fatal cases) became paralyzed at all and in more than one-half of these the paralysis was extremely mild. Of most importance, however, is the group of patients in which no evidence of paralysis appeared. This includes 69 per cent. of the total number of cases seen in the preparalytic stage. Zingher reports that of 54 cases treated in the preparalytic stage, 44, or 82 per cent., did not become paralyzed. Twenty-five of these patients were seen at the Willard Parker Hospital, and of this group 24, or 96 per cent., did not become paralyzed. Zingher also reports that 9 out of 10 cases treated intraspinally with normal human serum failed to develop paralysis. Amoss and Chesney treated 14 cases in the preparalytic stage of the disease by intraspinal and intravenous or subcutaneous injections of immune serum. Two of these died, 2 developed slight paralysis, and 10, or 71 per cent., remained unparalyzed. The best results were obtained in the patients who were treated earliest (within 48 hours of the onset), and who received the largest amounts of serum (over 30 c.c.) both intraspinally and intravenously or subcutaneously. All these results give evidence in favor of the use of serum in the preparalytic stage, but its administration in paralyzed cases, except where the disease is progressing, should probably be avoided, for it is quite possible that further harm might be done to the spinal cord by increasing the pressure in the spinal canal.

Schick Test in Poliomyelitis, Scarlet Fever, Measles and in Normal Children; its Bearing on Natural Immunity.—Study of a large series of cases of these diseases and of normal children by A. Zingher (*Amer. Jour. Dis. Child.*, 1917, xiii, 247) shows that the Schick test is positive between 1 and 4 years of age in about 32 per cent. of normal children, in a slightly larger proportion of cases of measles, in twice as many cases of scarlet fever and nearly three times as many cases of poliomyelitis. Susceptibility to one of the less contagious diseases, like poliomyelitis, indicates that the child is more apt to be susceptible to other contagious and infectious diseases. Natural immunity reveals interesting problems, which can be partly solved by a study with the Schick test in diphtheria immunity. A uniform technic of making the test, standard solutions of toxin, a uniform interpretation of the test, and a large series of cases are essential in any attempt at making important deductions from the results obtained with the Schick reaction.

Incidence of Bovine Infection of Tuberculosis in Children.—A bacteriological investigation of 281 cases of various clinical forms of tuberculosis in Edinburgh by various workers has resulted in the isolation of the bovine tubercle bacilli in 80 out of 102 cases (78.4 per cent.) under the age of 5 years; in 45 out of 64 cases (70.3 per cent.) between 5 and 16 years; and in 9 out of 115 cases (7.8 per cent.) above 16 years. These percentages of bovine tuberculosis are considerably higher than those obtained in England and in other countries. The most common fatal forms of tuberculosis in childhood, and especially in early infancy, are abdominal tuberculosis and tuberculous meningitis, and they together are responsible for about 90 per cent. of the mortality from tuberculosis in children under 1 year, and about 75 per cent. in children between 1 and 5 years. The material from 9 children dead from these two diseases was examined bacteriologically by Chung Yik Wang (*Edinb. Med. Jour.*, 1917, xviii, 178) and from 6 the bovine type of tubercle bacillus was isolated. A large percentage of children in Edinburgh is fed wholly or partly on cow's milk, and in a great number of instances the milk is consumed raw. These two incidents, together with the high percentage of tuberculous cow's milk, give an explanation of the prevalence of abdominal tuberculosis in Edinburgh, and, further, would account for the infection in the six cases of abdominal tuberculosis and tuberculous meningitis from which bovine tubercle bacilli were obtained. Children who were bottle-fed on raw cow's milk and also those fed on boiled cow's milk were tested with tuberculin; it was found that 37·5 per cent. of the first group of cases reacted, as against 15·4 per cent. of the second group. If the reaction be accepted as an indication of the presence of an infection in the body, the result, in a measure, affords corroboration to the bacteriological findings. Failing an adequate supervision of the milk supply, the most efficient way of safeguarding against the bovine type of tuberculosis is to subject all cow's milk for consumption to the process of sterilization by boiling. The material submitted to the investigation was available from children of the poorer class, and the results arrived at should, therefore, not be considered as strictly applicable to the community in general.

Longitudinal Sinus a Site for Obtaining Blood and for Transfusion.—E. M. Tarr (*Can. Med. Assoc. Jour.*, 1917, vii, 226) finds that puncture of the longitudinal sinus is a safe, simple and practical method of obtaining blood for diagnostic purposes. It can be done in any home or clinic. Very little assistance and apparatus are required. Intravenous medication may be attempted by this route by the general practitioner under ordinary circumstances. Blood transfusion by the sinus route offers many advantages over other methods and transfusion should be added as a therapeutic measure in the treatment of many diseases, including hemorrhagic disease of the new-born, primary hemorrhage, and the treatment of toxic and septic acute infectious diseases and in marasmic infants. The writer has entered the sinus 207 times for blood and has been disappointed but three times. Dextrose solutions have been administered sixty-four times in forty-nine infants. Salvarsan and diarsenol have been administered to eight infants under two and to one child twenty-eight months old. Nineteen cases of so-called acidosis in infants under two years were treated with sodium bicarbonate solution intravenously with fifteen reoveries. One child three years old was given, during a period of five days, 980 c.c. of the solution; discharged well on the tenth day after admission. A gold-plated lumbar puncture needle was used. The sinus grows gradually larger toward the back of the head and for this reason it is well to puncture the fontanelle as far posteriorly as possible.

Acidosis in Children.—E. Lackner and H. Gauss (*Amer. Jour. Dis. Child.*, 1917, xiii, 209) record the clinical course and necropsy in a case of acidosis. They say that there occurs in acidosis, lipemia from the failure of the body tissues to utilize the fats in the blood; lipuria, an outward expression of lipemia, also resulting from the excretion of fat in the waste products of the kidneys as fatty casts; fatty infiltration of the liver, which is a physiologic accumulation of fat from the blood; fatty degeneration of the kidneys resulting from acid intoxication; and anasarca resulting from impaired internal and external respiration.

Occurrence of Acidosis with Severe Diarrhea.—Investigations on more than 200 infants by O. M. Schloss and R. E. Stetson (*Amer. Jour. Dis. Child.*, 1917, xiii, 218) demonstrate that infants suffering from severe diarrhea with toxic symptoms often show the following signs of acidosis: 1, decrease of the carbon dioxid of the blood and alveolar air; 2, decreased carbon dioxid combining power of the blood plasma; 3, high ammonia coefficient in the urine; 4, increased tolerance to sodium bicarbonate; 5 improvement of the symptoms after administration of sodium bicarbonate. These signs are evident in some cases of diarrhea before the typical symptoms of intoxication have developed, and serve as a warning and therapeutic indication. If an infant suffering from severe diarrhea has hyperpnea, the diagnosis of acidosis is almost certain. If hyperpnea is not observed the diagnosis of acidosis must rest on laboratory evidence. Thorough and carefully controlled treatment by sodium bicarbonate usually causes disappearance of the acidosis, but despite this, the infants frequently die from a severe form of malnutrition.

Infective Theory of Acute Leukemia.—G. Ward (*Brit. Jour. Child. Dis.*, 1917, xiv, 10) has collected and analyzed reports of 1457 cases of leukemia of all varieties with reference to the possible infectious origin of the disease. The evidence is almost entirely against the infective nature of leukemia, the established facts being: (1) That there is a congenital form of leukemia which occurs in children whose parents are not leukemic. (2) That leukemic parents have never been known to transmit the disease to the new-born child. (3) That instances in which actual infection of one person by another might seem to have occurred are very few, although not necessarily devoid of significance. (4) That in having a marked preference for a particular sex and age leukemia differs from the infective class of diseases, and resembles the metabolic diseases and cancers.

Isolated Nasal Diphtheria.—J. D. Rolleston (*Brit. Jour. Child. Dis.*, 1917, xiv, 21) reports that isolated nasal diphtheria, *i.e.*, diphtheria originating in and confined to the nose, occurred in ninety-five out of 3000 cases of diphtheria (1·5 per cent.) admitted to hospital. It is most frequent in young children and in the cold months of the year. Congenital syphilis is a predisposing cause. The great majority of cases run a mild course, but rare examples of toxemic diphtheria confined to the nose undoubtedly do occur. The habitually mild course of isolated nasal diphtheria has been proved to be due to autoimmunization. Chronicity is a characteristic feature of isolated nasal diphtheria, the persistence of the bacilli being explained on anatomical grounds. Sequelæ occasionally occur, but are rare. Treatment by antitoxin is indicated. Local treatment should be avoided. The term "fibrinous rhinitis" should be reserved for those comparatively rare cases in which this form of rhinitis is due to other causes than the diphtheria bacillus. The practical significance of isolated nasal diphtheria consists in its epidemiological importance.

Cultivation of Micrococcus from Blood in Measles.—R. Tunnicliff (*Jour. A. M. A.*, 1917, lxviii, 1028) reports that she has shown by cultures the almost constant presence of a diplococcus in the blood of measles patients during the pre-eruptive and eruptive stages; its presence alone and in large numbers before the appearance of the eruption and alone also in a large proportion of cases at the height of the infection, and its presence at the same time in the throat, nose and eyes.

Epidemiology of Baciliary Dysentery.—W. J. Smillie (*Amer. Jour. Dis. Child.*, 1917, xiii, 337) presents a study of bacillary dysentery in Boston during 1915 and 1916. This shows that bacillary dysentery is a readily communicable disease which may be spread in a community by means of contact with an acute case or a carrier, by means of food, as milk, condensed milk and icecream, by water, and by flies. The sporadic summer bacillary dysentery of infants may be transmitted to older children or to adults. Though the disease is severe in the infant, it is usually mild in older children or adults. As a general rule, the older the child, the milder the disease. The dysentery bacilli from the stool of an adult with a mild case of dysentery may produce a rapidly fatal dysentery in infants. Thus the menace of the mild adult case to the community is considerable. Bacillary dysentery is rarely found in a nursing baby. Hospital contact cases are not uncommon. The disease is very readily transmissible by direct contact, and no hospital has a right to admit patients with dysentery unless it can make provision for their isolation.

Hypertension in Nephritis in Childhood.—From a study of blood pressure observations in ninety-three cases of nephritis in children between the ages of two and twelve years, H. K. Berkley and J. M. Lee (*Amer. Jour. Dis. Child.*, 1917, xiii, 354) say that the blood pressure is elevated in the nephritis of childhood, and occasionally to a marked degree. This applies to both acute nephritis and chronic nephritis. Systolic and diastolic pressures are not increased to the same degree, the former averaging about 20 mm. Hg., and the latter about 10 mm. above normal. The pulse pressure is increased, but the factor is not constant. The blood pressure in chronic nephritis shows no constant elevation above that of acute nephritis. The blood pressure may, in rare instances, be of prognostic value. No relation has been found to exist between the blood pressure and the urinary findings. Patients having marked edema showed a slightly higher average blood pressure than those with little or none. This difference is not great enough to warrant definite conclusions. Albuminuric retinitis is probably not common even in cases showing a marked increase in blood pressure.

Perlèche.—A. L. Smith (*Arch. Pediat.*, 1917, xxxiv, 274) believes that the principal predisposing cause of perlèche is the increased flow of saliva, which in turn is the result of some abnormal condition about the nasal or oral cavity. The exciting organism is an anaerobic streptococcus. This the author has isolated in pure culture in 135 of his series of 223 cases. The staphylococcus invades the lesions secondarily. The lesions will not heal permanently until the conditions causing the increased flow of saliva are removed. After this the local condition can be treated successfully. Paint the lesions with a 50 per cent. solution of silver nitrate and when dry apply Lassar's zinc oxid paste. If the lesions do not disappear in a few days, spirits of camphor or alcohol are applied. If the flow of saliva has not decreased in amount, tincture of belladonna should be given internally until the physiological limit is reached. When pus infections are present the crusts should be soaked with a 1–1000 solution of bichloride of mercury, then removed and the area covered with 5 per cent. ammoniated mercury ointment.

Pellagra in Children.—Until recently the occurrence of pellagra in children, to any extent, was denied. W. A. Murphy (*Arch. Pediat.*, 1917, xxxiv, 254) says that the number of cases in children is 10 per cent. of the whole. The virulence of pellagra in children is apparently decreasing. In diagnosis it is essential to consider sprue. It is not hereditary or transmissible from mother to nursing infant.

Fragilitas Ossium and its Association with Blue Sclerotics and Otosclerosis.—E. Bronson (*Edinb. Med. Jour.*, 1917, N. S., xviii, 240) gives a description of two families with hereditary fragility of the bones associated with gray-blue sclerotics, and in the first family with otosclerosis also: A summary of the literature of these peculiarities in relation to fragilitas ossium is presented, together with a general discussion of the whole subject, case reports of the congenital type, and a bibliography. In the *first family*, consisting of fifty-five individuals in four generations, twenty-one had gray-blue sclerotics. Of these twenty-one, only one, a six-year-old boy, who survived infancy, has had no fractures. The number of fractures in any individual is not excessive, and they require a certain amount of force for their production. Sprains and dislocations are also common. The majority of adults are in good general health, and are able to do ordinary work. The mortality among infants with blue sclerotics is in this family greater than among those not affected. The heads of those individuals in this family who have blue sclerotics and bone fragility show an abnormal prominence of the frontal and occipital bones. In two of them there is a history of patency of the fontanelle throughout life. Of eight adults with blue sclerotics and fractures, seven had varying degrees of deafness, the eighth died at twenty-three without deafness. In the *second family*, consisting of eight individuals in three generations, seven have blue sclerotics, and four of these have had fractures, two others have a tendency to sprains. All are able to lead an ordinary life, except one child, who is somewhat crippled and incurs fractures too easily to be able to run and play. In this family the head has the characteristic shape frequently seen in Osteogenesis Imperfecta congenita, namely, increase in the bitemporal diameter, so that the ears are turned outward and downward, slight downward tilting of the axis of the eyes, and an underhung lower jaw. There is no tendency as in the first family to deafness, nor is there any to arterial sclerosis. In both families the stature of the affected individuals is below the average, with the exception of three members of the first family. The etiology of the affection is unknown. The hereditary factor is present in only a limited number of cases. Clinically the condition is characterized by defective cranial ossification and by numerous fractures without violence. The earlier the onset the greater is the liability to fracture. Dislocations also occur. Blue sclerotics may or may not be associated. A limited number of metabolic studies indicate an increased loss of calcium. In both prenatal and postnatal onset of symptoms pathological findings indicate a deficient functional activity of the osteoblasts. In respect to other abnormalities writers disagree.

Operative Immobilization of the Spine.—F. De Quervain and H. Hoessly (*Surg., Gyn. and Obst.*, 1917, xxiv, 428) employed Albee's method in five dogs, removing a slab of bone from the ulna and implanting it on the lumbar spinous processes. About two months later on the average, after bony union was achieved, they removed ventrally parts of the vertebral bodies from under the bone implant, thus producing a complete gap in the continuity of the vertebral bodies. These animals did not show the least deviation from the normal direction of the spine, but a control series of dogs without the implant presented a distinct kyphosis. To determine the supporting power of the bone-graft those parts of the spine which had been previously immobilized by means of osteoplasty were dissected and a piece of bone was then excised from the ventral side of the corresponding vertebral body. The whole specimen was then changed in the direction of the backbone axis and the weight gradually increased until a slight curving of the inlaid bone and an approximation of the vertebral bodies was just apparent. The investigation of several specimens proved that a weight of from 30 to 40 kilograms was supported by the immobilized portion of the spine without the least sign of curving. These experiments prove that the implanted bone-graft is capable of preventing a collapse of the vertebral bodies. Similar tests as to the supporting power of spontaneous bony growths between the spinous processes in human specimens of gibbus proved that natural, dorsal ossification possesses no slight supporting power; it amounted in the specimens to as much as 30 kilograms. Albee has also implanted bone-grafts into the spinous processes of dogs. He did not, however, destroy any of their vertebral bodies, so that the conditions for a kyphosis were lacking, and the bone inlay was in no way subjected to traction or pressure. The transplantation was, therefore, carried out on perfectly normal spines. Microscopic investigations of autotransplanted bone-grafts two weeks, three weeks, and four to eight weeks after implantation have shown that an autotransplanted bone-slab for the greater part dies and is replaced by new bone. This explains how it is that boiled, antiseptically prepared, macerated, even decalcified bones can also be successfully employed as transplants. Whether we chip out the bone-graft with a chisel, or with a specially constructed trephine, whether or not we incise the periosteum of the bone-graft in order to facilitate the process of osteoplastic proliferation, can certainly be of no importance if only the transplantation be attended by success. Neither is it necessary to keep the bone-graft in salt solution or in sterile vaseline. The paramount condition for a successful issue is a strictly aseptic and rapid operation, using a solid and compact bone-slab which, from the beginning, insures thorough immobilization, and provides the spine with the essential support. Albee's opinion that the bone-graft possesses antibacterial force is entirely without foundation. As regards osteoplastic immobilization of the spine in Pott's disease, the writers say that it is not in itself a cure, but the best mechanical means of preventing a gibbus. The operation seems superfluous when pain caused by the weight of the body is not the prominent feature, and when an inclination to gibbus formation is not present. It offers the advantage of more rapid mobilization of the patient, when the inclination to gibbus formation and pain in consequence of bodily weight and pressure can be removed by an expedient form of recumbency (ventral recumbency). It is to be desired in such cases as show a continued inclination to gibbus formation in spite of judicious recumbency.

Lipodystrophia Progressiva.—F. P. Weber (*Proc. Royal Soc. Med.*, Section Study Dis. Child., 1917, x, 81) states that "lipodystrophia progressiva" is not always *progressive*, certainly not in regard to the area affected. It usually commences in childhood, especially at six to eight years of age. In some cases the fat-atrophy in the upper parts is preceded by increase of fat in the buttocks or legs; this increase in fat is therefore apparently the first sign of the commencement of the disease or syndrome in question. This disease or syndrome is not confined, as at first it was supposed, to the female sex. Genuine examples have been recently recorded in males, and it is probable that some of the cases (especially in males) which were formerly labelled "bilateral facial atrophy," were likewise genuine (though less extensive) examples of lipodystrophia progressiva. Perhaps it will be found that in males the fat-atrophy is more often limited to the face and neck than in females. The etiology is unknown, but is probably connected with a disorder of the internal secretions (endocrinic origin). The fat-atrophy, however disfiguring it may be, and though it may give rise to annoying suspicions of tuberculosis, etc., does not signify any danger to life, and is not usually accompanied by loss of strength and general health.

Nonprotein Nitrogen of the Blood in Atrophic Infants.—In a series of cases L. D. Minsk and L. W. Sauer (*Amer. Jour. Dis. Child.*, 1917, xiii, 397) found that the blood of infants recovering from the milder intestinal disorders contains between 20 and 30 mg. of nonprotein nitrogen per 100 c.c. as determined by the method of Folin and Denis, agreeing with the values obtained by several authors for normal individuals. The urea nitrogen forms about 50 per cent. of the nonprotein nitrogen. In atrophic infants the nonprotein nitrogen frequently exceeds 30 mg. per 100 c.c. of blood, and these findings seem to be associated rather frequently with a bad prognosis. A low urea nitrogen associated with a low nonprotein nitrogen in atrophic infants seems to be a favorable sign.

Nitrogen Partition in Urine of Normal Children.—A study of the nitrogen partition in the urine of two groups of healthy children was made by M. R. Johnston and B. S. Veeder (*Amer. Jour. Dis. Child.*, 1917, xiii, 402) to establish normal figures. One group was fed on an ordinary or standard diet containing meat and vegetables, with the quantity regulated by age periods. The second on a creatin-creatinin-free diet in which the quantity of food (and hence of nitrogen) was regulated according to body weight. In both groups the N partition was practically the same, with the exception of the uric acid nitrogen. Urea N makes up from 80 to 85 per cent. and ammonia N from 3 to 5 per cent. The combined figure for the two is less than 90, rather than above 90, as in adults. Creatin is constantly present, as is creatinin. The two combined form a smaller percentage than the creatinin alone in the adult. The amount of undetermined or "rest" N is high in children.

The D'Espine Sign in Tuberculosis in Children.—C. J. Bloom (*New Orleans Med. & Surg. Jour.*, 1917, lxix, 748) has found the D'Espine sign a valuable aid in the diagnosing of tracheobronchial glandular and pulmonary tuberculosis in childhood. In his series of seventeen cases, in each case a positive sign was obtained by physical findings and corroborated by the radiologist. The tuberculin reaction proved positive in three of the seventeen cases. The D'Espine sign is more significant under ten years of age; a negative D'Espine does not eliminate a positive diagnosis. A positive D'Espine does not always indicate a positive pulmonary or tracheobronchial glandular tuberculosis—but it does signify an enlargement of the tracheobronchial glands.

Morbidity and Mortality of Pertussis and Measles with Particular Reference to Age.—A study of the morbidity and mortality of measles and pertussis by B. S. Veeder (*Arch. Pediat.*, 1917, xxxiv, 322) shows that, on an average, between 9,000 and 10,000 deaths from each disease take place annually in the United States. While the death rate as a whole, and for certain diseases as tuberculosis, diphtheria, diarrhea and enteritis under two years, and typhoid fever, shows a decrease in the registration area in the past fifteen years, that for measles and pertussis has remained practically the same. No disease that causes 1 in every 100 deaths, or that rolls up an annual toll of between 9,000 and 10,000 lives a year is insignificant or unimportant. Nearly 80 per cent. of the pertussis and over half of the measles deaths occur in infants. The older the child the lower the case fatality rate. The widespread impression among the laity that it is a good thing to have these common infections of childhood early and get them over with is erroneous. The longer they can be warded off, so much less the chance of fatal or damaging complications. The mortality of the first year of life is greater than the combined mortality of the rest of childhood. A part of this—birth accidents—congenital malformations, etc.—may be termed fixed and is irreducible, but far the larger part is preventable to a certain extent. Somewhere between 5 and 10 per cent. of the mortality which may be lessened is due to measles and pertussis.

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ORIGINAL COMMUNICATIONS.

UNILATERAL DEFECT OF TUBE AND OVARY, A STUDY IN PRENATAL PATHOLOGY.

BY

GEORGE GELLHORN, M. D., F. A. C. S.,

Associate in Clinical Gynecology Washington University Medical School,

St. Louis, Mo.

(With one illustration.)

Absence of both tubes and ovaries is of excessive rarity. According to Nagel(1), Holzbach(2), and Kermauner(3), it has only been noted in a few cases of nonviable monstrosities in which the uterus, too, was lacking.

Absence of one tube and ovary is more frequent, though still rare enough to attract attention. An interesting observation of this kind was made accidentally by the writer during a laparotomy for fixed retroflexion and tumor of the right tube, presumably a pyosalpinx. After the abdominal cavity was opened the following conditions were found. About halfway between symphysis and umbilicus, the cecum presented itself in the median line. From it, the appendix vermiformis led straight downward into the true pelvis where it was firmly adherent to the fundus of the retroflexed uterus, a little behind the intertubal line. This adhesion having been broken, the appendix was removed in typical manner. Although there were no further adhesions about the uterus, that organ could not be lifted out of its displaced position until the right adnexa had been liberated from numerous and fairly dense adhesions binding them down to the peritoneum of the posterior pelvic wall. The right ovary was found to be but little enlarged. The right tube was normal in its uterine half. The outer half was considerably thickened and was about to the occluded by a constriction of the peritoneum at the base of the fimbriæ, a mechanism made familiar to us through the researches of Opitz(4), Kleinhans(5), Ries(6), and Frankl(7). To relieve the tube and prevent the threatening occlusion, the ring of thickened peritoneum was nicked in several places.

This precaution was further indicated in view of the condition observed on the left side of the uterus. *On this side, there was no trace of either tube or ovary.* After the right adnexa had been freed, the uterus lay well in the median line. *Its configuration was perfectly normal; the fundus was developed symmetrically.* The organ was perhaps a trifle small but not more so than would be expected in a nullipara of nineteen years. The left horn where normally the tube and round ligament are inserted, showed a well-rounded curve which led down to the slender cervix. The peritoneal covering throughout

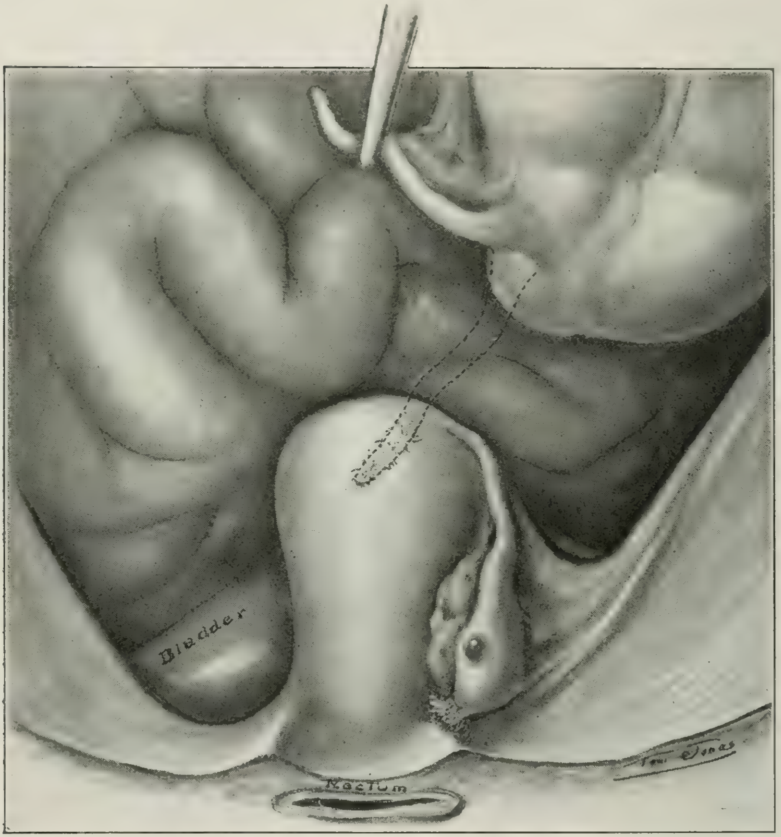

FIG 1.—Posterior view of pelvic structures in a case of congenital absence of the left adnexæ.

was smooth and glistening without any scar. The broad ligament was also absent and the peritoneum of the bladder blended with that of the posterior culdesac and the anterior aspect of the rectum across the well-marked parametrium. There was no sign of a round ligament between the left uterine horn and the inguinal canal, but when the uterus was pulled to the right and upward, a fold appeared leading from the inner inguinal ring inward and downward and losing itself anteriorly in the peritoneum in the region of the isthmus of the uterus. This fold was not merely composed of peritoneum, but on palpation between the fingers a thin round cord could be plainly felt.

These conditions are represented in the accompanying drawing prepared after a sketch made immediately after the operation. The fold between the inguinal ring and the uterus is not shown in the picture as the pelvic structures are seen from behind.

In view of the well-known fact that an ovary not present in its normal place, may be found either fully developed or in rudimentary form at some distance from the uterus or even scattered in small detached portions over the peritoneum of the broad ligament and its vicinity, a most careful search was made which, however, proved futile. The peritoneum everywhere showed its peculiar luster undisturbed and the palpating finger could not even discover any unevenness of surface. Nor was there any deposit of ovarian substance in the omentum or upon the surface of the sigmoid flexure, so that the complete absence of tube and ovary could be demonstrated to the satisfaction of the audience.

The operation was then concluded by closing the abdominal incision in the usual fashion. The recovery was rapid and uneventful.

Considering the strange anomaly encountered, the history and physical examination of the patient gained in importance.

The patient, a girl of nineteen, is the child of healthy parents and there is no congenital malformation in the family history except that of a first cousin who is a deaf-mute and paralyzed from birth. She herself had been healthy as a child. Menstruation appeared first when she was twelve years old, occurred quite regularly and lasted three to four days. The flow was rather free, but without clots and accompanied of late by some pain which, however, has disappeared since the operation. Persistent pain in her back and right lower abdomen prevented her working for the last few months and caused her to enter the hospital.

On physical examination the patient appeared well formed in every respect. All the secondary sexual features were well developed.

One more point demanded elucidation. Paltauf(8) and others have demonstrated that aplasia of the tube and ovary is usually associated with absence or rudimentary development of the kidney on the corresponding side, but, unfortunately, no attention had been given during operation to the presence or absence of the left kidney. This question, then, had to be determined by means of the cystoscope a few weeks later. For this purpose, 20 c.c. of a 4 per cent. indigo-carmine solution were injected into the gluteal muscle according to the method of Joseph and Voelcker. Five minutes later a cystoscopic examination was made. The capacity of the bladder was normal. The bladder mucosa showed no abnormalities but trabeculæ were well marked in the bas-fond. The right ureteral opening was found in its normal place and began, eight minutes after the injection, to emit dark blue stained jets of urine in typical manner. *On the left side there was no sign of any ureteral opening nor of any emission of stained fluid.* The configuration of the trigonum was asymmetrical. On the right side a vascularized area extended from the sphincter in the form of a slender tongue in the tip of which the right ureteral opening was located, while on the left side no such continuation could be seen.

The absence of a ureteral opening thus suggested the absence of the left kidney.

EPICRISIS.

The case described in the foregoing opens up an interesting chapter of prenatal pathology. Unilateral defect of tube and ovary may be either congenital or acquired. Adopting the definition given by Klob(9) in 1864, a congenital defect of the sexual organs results from the lack of the "anlage" and is thus a true or primary aplasia. If, on the other hand, the sexual apparatus had once been formed but was later subjected to harmful influences which caused a total or partial disappearance of the genital tract, the term "congenital aplasia" would be incorrect; such an anomaly is an acquired or secondary defect.

In order to know whether to classify our case as a congenital or acquired anomaly, it is necessary to recall well-established embryological data. The sexual organs have their origin in the Wolffian bodies. From them are derived both the ovaries and the Muellerian ducts. The latter are hollow tubes which converge toward the median line and finally fuse together to form a single tube in the lower part of their course thereby giving rise to uterus and vagina. Their proximal portions, however, remain separate and form the tubes. If now, there is no Wolffian body on one side, there can be neither ovary nor Muellerian duct on this side, but the Muellerian duct on the other side produces out of itself tube, uterus, and vagina respectively. The same conditions prevail if the Wolffian body is present but, for unknown reasons, the *anlage* of the sexual organs is lacking. In such cases the womb has the characteristic form of the uterus unicornis; it is an elongated and somewhat spindle-shaped organ which leans in a more or less pronounced curve toward the side containing the ovary while the tube emerges from the highest point of the fundus. In the human such absence of tube and ovary is always pathologic, but in birds and certain reptiles [Nagel(1) Holzbach(2)] it is physiologic since in them only the left Muellerian duct develops normally.

The form of the uterus unicornis is not always as typical as just described. Braun(10) mentions a case of this kind in which the outer appearance of the uterus was more nearly normal but the correct diagnosis could readily be established since the adnexa on the right side, the only ones present, inserted more toward the middle of the fundus than would be the case in a perfectly normal uterus.

The condition of the round ligament deserves particular attention in the light of recent embryologic studies [O. Frankl(11)]. It serves originally to support the lower pole of the Wolffian body and it is inserted at the place where the Wolffian duct leaves the Wolffian body. The two last-named structures are in close apposition with the Muellerian ducts at the place where the fusion of the latter results in the formation of the uterine body or, to be more precise, the uterine horns. After the physiological involution of the Wolffian body has occurred only traces of it remain in the paroophoron and epoophoron; the Wolffian duct, too, disappears with the exception of a few remnants which embed themselves in the substance of the uterus. The round ligament, however, persists and is eventually inserted upon the uterine horn, having been conducted there, as we have seen, by the two deciduous structures. It is clear that there can be no round ligament if there is no Wolffian body to support or no uterine horn to fasten itself to, *and thus we find in all cases of true uterus unicornis the round ligament absent on the affected side.**

We need not, however, go into further details nor consider the voluminous literature on uterus unicornis, because the uterus in our case exhibited none of the characteristics of this anomaly. It will be remembered that in this case the uterus was of normal shape and size, and in normal position; that the right adnexa emerged from their proper place at the edge of the uterus; and that the left round ligament was present though poorly developed. We are, therefore, forced to explain the absence of the left tube and ovary in our case on grounds other than congenital, and it may be mentioned at once that Braun(10) in his careful and critical study, declared that all cases of normally developed uterus with unilateral absence of the adnexa were of acquired origin, a view which is shared by all recent writers on the subject.

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*It is evident that arrests of development have been omitted in this consideration as not belonging to our subject. If the Muellerian ducts have been formed but remain arrested at lower stages of their development, we may find the organs present but only in rudimentary form. Thus, one Muellerian duct may develop normally thereby forming a uterus unicornis, while the other Muellerian duct may be arrested in its development which would result in a rudimentary uterine horn on the corresponding side. In such a case, there is a round ligament on either side. A case in question is the one reported by M. Hoenigsberg(12) in which the left rudimentary uterine half was represented merely by a strip of thickened tissue of less than 1 cm. in width, and yet, the left round ligament appeared fairly normal, suggesting that originally there had been a Muellerian duct present.

What are the forces that may so profoundly influence an already established organ? Two possibilities have been suggested. Rokitansky(13) in 1861 ascribed an acquired unilateral defect to a sort of spontaneous amputation which he termed "Abschnürung." This occurrence may be likened to intrauterine amputation of extremities due to amniotic adhesions with this difference, that the pathologic process takes place within the abdominal cavity of the fetus. The etiology was sought in a constriction of the organs in question by peritoneal adhesions due to a fetal peritonitis. This teaching inaugurated by Kussmaul, afterward met with a great deal of scepticism [Kossmann(14)] but has more recently been supported beyond any doubt by Busse(15) who demonstrated the remnants of such a fetal peritonitis in the form of cicatrices and adhesions. The cause of this fetal peritonitis is entirely obscure.*

More often, however, a unilateral defect of tube and ovary seems to be due to torsion with subsequent atrophy of the adnexa. The process has its analogy in postnatal pathology. The so-called migratory fibroid of which, among others, Peterson has written recently, is originally a pedunculated fibroid whose pedicle becomes twisted until the blood supply is cut off. The pedicle then atrophies and eventually separates spontaneously from the uterus.

Cases illustrating the effect of either peritoneal adhesions or torsion have been described by Frankl(7), Heschl(16), Klebs(17), Baumgarten(40), E. v. Graff(18), Egger(19), Marchand(20), Thaler(21), a. o. The defect may be either partial or total. It may involve the tube alone, or only the ovary, or both structures may be affected simultaneously according to the site and extent of the adhesions or the twist. The nature of the attacking force is demonstrable in some cases more easily than in others. The mechanism of torsion, for instance, is well illustrated in one of Natanson's(22) cases (No. 15) although the author himself prefers a different interpretation. In this case only the right tube was affected, the rest of the genitalia being perfectly normal. The tube, about 9.5 cm. from the uterine horn, ended blindly; between this and the fimbriated end there was a free space of about 3 cm. The extant part of the tube showed a markedly twisted course. The case described by Doléris (23) seems to me to belong to the same category, and equally so the two observations recorded by Spencer(24). In the first of these cases, the uterus was found normal. In the place of each cornu there was a pea-like knob. There was no sign of the main portion of the tube on either side, but traces of the fimbriated end were found in the wall of the ovarian pouch on the posterior leaf of the broad ligaments. Both ovaries and both round ligaments were normal. In the second case both tubes ended conically 1 and 2 cm., respectively, from the uterine horns. The rest of the genitalia was normal. Doran, in a note appended, commented upon these cases as being congenital malformations but we do not hesitate to pronounce them as acquired defects. We only have to recall the twisted course of the tubes in young fetuses to understand, without difficulty, that occasionally the twists may become exaggerated and exert a deleterious effect upon the affected portion. It will depend upon the site of the torsion whether a larger or smaller part of the tube is destroyed and disappears.

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* It seems possible that even a postnatal peritonitis may exert a like effect as shown, for instance, in the case reported by Seitz in which an "inflammation of the bowels" acquired at the age of nine, had produced an excessive formation of adhesions. When the patient was subjected to laparotomy twelve years later, no sign of the right ovary could be detected.

If the ovary is included in the twist, and becomes cut off from its connection with the uterus, it is found either as a whole or divided into a number of small cystic fragments attached somewhere else to the pelvic peritoneum, or to the omentum (Braun), or else it lies free in the peritoneal cavity (Baumgarten, Melville). Strictly speaking, these cases are not instances of ovarian defect but belong to the category of abnormally located ovaries.

The most recent instance of this kind has been reported by Ward(25). In this case, the uterus was perfectly normal, but the left adnexa were absent. A small stub one-quarter of an inch in length was observed at the uterine horn. The top of the left broad ligament was simply an extremely thin membrane. A smooth unattached stone-like body about three-fourths of an inch by one-half inch in width was found lying in the culdesac of Douglas.

Though the laboratory report diagnosed this body as a "calcareous gland," Ward's own interpretation of a twisted-off, migratory ovary is undoubtedly correct.

When the ovary cannot be found anywhere we must assume that it has become completely absorbed. It goes without saying that only such cases have any value in which on the operating or postmortem table a diligent search has been made. For this reason cases such as mentioned by Baldy, Mundé a.o. which were not verified by ocular inspection, cannot be considered here.

Marchand(20) at autopsy found the pelvic organs of a girl of one year normal, but on the left side the ovary was absent together with the greater part of the tube and broad ligament.

Edridge-Green(26) discovered in a child of one month the absence of the right tube, ovary and kidney. "The right superior angle of the uterus was rounded off and completely covered by the peritoneum." As the child had two thumbs on the right hand and "two accessory auricles in the position of the upper bronchial cleft and the intermaxillary cleft," this case is most likely one of congenital aplasia and not of acquired origin.

Jesset(27) reported a case of total absence of the left ovary with rudimentary development of the left tube.

Sachs(28) described the postmortem findings in a woman of twenty-eight years, in whom the uterus and left adnexa were perfectly normal; of the right tube there was but a rudiment of 4 mm. extant while the right ovary was completely absent. The right round ligament was normal as to size and insertion.

Herzl(29) records the case of a normal uterus with rudimentary right tube and totally absent right ovary.

In the case described by Hauser(30), the patient had given birth to two children. The uterus was enlarged by an interstitial fibroid but otherwise of normal configuration. The left adnexa were normal. Of the right tube only a stump of 1.5 cm. remained while the right ovary with the ovarian ligament was absent. The right round ligament was normal.

The patient of Thaler(31) showed similar conditions. She had had three children and was laparotomized for a uterine fibroid. The configuration of the uterus was normal, the left adnexa and both round ligaments were also normal. The right tube ended conically 9 cm. from the uterus; of the right ovary with its ligaments there was nowhere any trace.

Dudley(32) operated in one case for the removal of the suppurating right tube and ovary and found a perfectly normal uterus and entire absence of the left tube and ovary. There was only a slight protuberance at the left uterine cornu to mark the point where the tube should have joined the uterus. He refers to a similar case by A. Martin.

This, then, is the entire literature which the writer has been able to find on the subject. In his case, however, the disturbance in the development of the adnexa is more pronounced than in any case heretofore reported. The question whether the defect was caused by torsion or fetal inflammation must be left in abeyance. The writer is inclined to assume the latter possibility because of the absence of any stump. The fact that the peritoneum was absolutely smooth does not militate against this hypothesis since in the cases of Braun and Melville where the effects of a fetal peritonitis were clearly demonstrable, the serous covering was as smooth and free from scars as in ours.

At what stage of embryonal development must the assumed pathologic disturbance have set in in order to produce the effect observed in our case?

The fusion of the Muellerian ducts into the uterus begins, according to Wendeler(33), to take place in the third month and is completed at the fifth month. Holzbach(2) put this development at a somewhat earlier date. He says that the fusion of the Muellerian ducts proceeds from below upward and reaches its upper limit, that is to say, forms the uterine fundus, at the end of the third or in the course of the fourth month. Buettner(34) expresses himself similarly. This means that in our case of normally developed uterus the pathologic process cannot possibly have affected the left tube and ovary prior to this period. Menge(35) very justly points out that before this time any harm befalling the proximal part would most likely affect the entire duct. The rudimentary and abnormal insertion of the round ligament of which I have been unable to find an analogy in literature, adds but an apparent difficulty to our interpretation. We have seen above that the round ligament which originally is connected only with the lower pole of the Wolffian body, is conducted by the latter to the uterine fundus. When the physiologic involution of the Wolffian body occurs the insertion of the round ligament is transferred to the uterus. If we now assume that a fetal peritonitis has attacked and eventually destroyed the free end of the Muellerian duct and the ovary at the moment when the fusion of the Muellerian ducts had been completed, that is, between the fourth and fifth months, it must have also affected the adjacent Wolffian body so that the ultimate union between the uterus and the round ligament could not take place. The median end of the latter was left free, so to speak, and too short to reach the uterus; it, therefore, developed only as a rudiment and thus we find its extremity losing itself somewhere beneath the peritoneum.

A word must be said about the left kidney in our case. The result of the cystoscopic examination which was described in detail above, makes the supposition highly probable that the left kidney was absent. If this is true, the case presents another exceptional feature. For the absence of one kidney is very rare [Keyes(36)]. Morris(37) has collected records of only ten instances among 24,542 autopsies. The development of the urinary and reproductive organs stands in such close relationship that anomalies of the one are usually observed with those of the other system [Paltauf(8)]. In such cases, the developmental disturbances of the two systems occur on the same side [Ballowitz(38)]. As far as our observation is concerned, a satisfactory explanation may be found in the suggestion of Daniel(39) that in exceptional cases the kidney may atrophy and the ureter fail to reach the bladder as the result of early embryonal inflammation and its surroundings.

SUMMARY.

During a laparotomy on a girl of nineteen, whose sexual characteristics were normally developed, the total absence of the left tube and ovary and of the left broad ligament was accidentally discovered. The uterus possessed a perfectly normal configuration. The right adnexa were inserted at the uterine horn. The right round ligament was present only in a rudimentary form. Chromocystoscopy revealed the absence of a ureteral opening on the left side which suggested absence of the left kidney.

In analyzing the anomalies encountered, we must distinguish between congenital and acquired defects. In a congenital or primary aplasia of one tube and ovary, the uterus has the characteristic form of the uterus unicornis, an elongated and spindle-shaped organ which leans toward the side where the adnexa are present. On the other hand, if the uterus is of normal shape, as in our case, aplasia of one tube and ovary must be considered a secondary defect; that is to say, it is acquired in antenatal life. The etiologic factors are either torsion of the adnexa or fetal inflammation. The few cases that have thus far been recorded in literature are reviewed in the foregoing. In none of them, however, is the defect as complete as in ours. The observation here reported is an interesting contribution to the study of prenatal pathology.

ADDENDUM.

After this paper was finished, a very important contribution by Ballantyne appeared in the "New System of Gynecology," by Eden and Lockyer (1917, i, 215). Ballantyne quotes the following observation by Bonnaire and Durante. The specimen (of which a good picture is added) was obtained from the body of a woman who died of heart disease soon after her confinement. The right kidney was absent and the left was very large. The uterus was retroflexed and was normal in form. On the left side, there was a normal broad ligament, tube and ovary, but on the right side the margin of the uterus had no structures attached to it. In the right lumbar region, however, there was a Fallopian tube with fimbriated end, an ovary with scattered ovisacs in it, and from the lower end of the tube a cord passed downward to terminate at the internal inguinal ring. Bonnaire and Durante, and with them Ballantyne explain this anomaly as an arrest of development, but in connection with the views expressed in my paper, it cannot be doubted that the case of the French authors is an excellent example of a pathologic process acquired *in utero*. The tube, ovary and round ligament were cut off from the uterine horn by torsion or more likely by fetal inflammation and thus prevented from making their descent into the pelvis. In spite of their displacement they continued to develop, while in my case they were absorbed completely. There is, then, between this case and mine only a difference in degree, and not in kind.

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UTERINE FIBROIDS WITH REFERENCE TO THEIR TENDENCY TO BECOME SARCOMATOUS.

A Study of 100 Consecutive Cases.

BY

FRANK WARNER, M. D., F. A. C. S.,

Columbus, Ohio.

(With three illustrations.)

A TRUE uterine fibroid, derived primarily from the connective tissue fibroblasts, is a tumor, infrequently seen except in childhood, and then only in association with a malignant growth, fibrosarcoma. Myomas, as shown by Adami(1), do not occur in the very young.

The so-called uterine fibroid is, as a rule, a leiomyoma, for the tumor develops from the smooth muscle cells of the organ in which the growth is situated. Just as the epithelial invasion of certain cells into tissue stimulates excessive production of fibroblasts, notably in the breast, where the tumor is a slowly growing one and the scirrhous type of neoplasm is the result, so in the uterus, these newly developing smooth muscle cells, produced in such quantities, stimulate the formation of new connective tissue. This later undergoes contraction and obliterates to a greater or less extent the original constituent parts of the smooth muscle-cell tumor. On the other hand, rapid growth of this tumor develops a myoma that is substantially free from connective tissue, being composed of muscle cells alone.

The tendency of uterine leiomyomata is to undergo retrogressive changes of one sort and another. There is also a predisposition to the development of an associated sarcoma, variously estimated anywhere from 2 to 15 per cent. The latter figure is doubtlessly obtained by a very liberal interpretation of the significance of some of the very cellular varieties of leiomyomata.

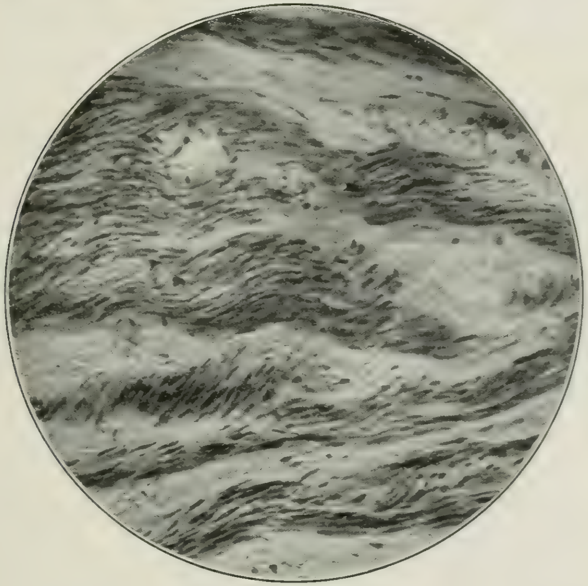

FIG. 1.—Microphotograph of a section of leiomyoblastoma with a rather large amount of connective tissue stroma.

When epithelial cells take on a lawless growth and arrangement among the uterine muscular fibers, one is safe in calling this carcinoma and in divining its prognosis. To say with certainty that a leiomyoma is associated with sarcoma, one must be able to demonstrate some of the well-known indications of malignancy: its cellular character, the irregular size and arrangement of its cells, the presence of numerous mitotic figures, the breaking through of the capsule and the tendency to the complete breaking down of some of the areas, as well as lymphatic and nodular metastases in the more advanced stage of the tumor.

The term sarcoma is ordinarily employed to indicate those malignant tumors which take their origin from connective-tissue cells. There is, however, a definite group of malignant tumors arising from smooth muscle cells which are called malignant leiomyoblastomas or leiomyosarcomas.

While making a pathological study of 206 cases of epithelial malignancy in their relation to arteriosclerosis and other anatomical changes of old age(2), my attention was forcibly attracted to the very cellular character of some of the uterine fibroids which gave them an appearance not unlike that presented in sarcomas. As there has been such a variety of expression with reference to their becoming malignant or sarcomatous, it seemed desirable to make a careful and detailed pathological study of 100 consecutive cases of uterine fibroids, the frequency of their association with sarcoma and of those which presented evidence of their having arrived upon the border-land of this malignant development or association. In addition a study of the various degenerative features associated with these fibroids was also undertaken.

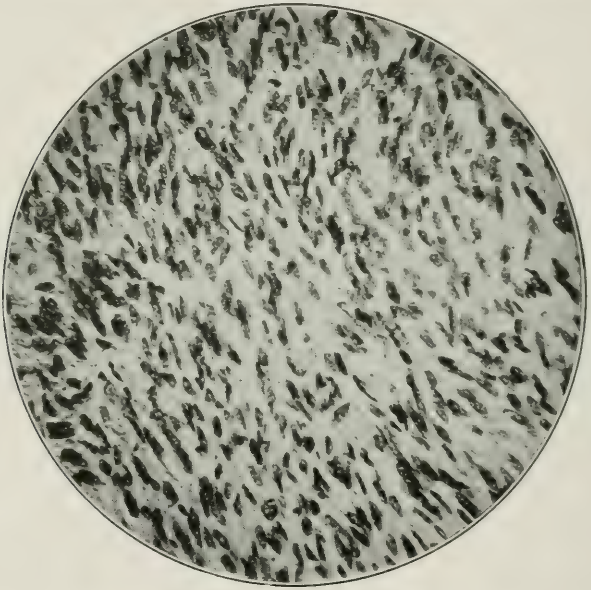

FIG. 2.—Microphotograph of a section of a cellular variety of leiomyoblastoma.

The examination of 100 consecutive specimens of uterine leiomyomata gave the following results:

Seven per cent. of the specimens were of a very cellular type; 18 per cent. were of a moderately cellular growth; 75 per cent. were of a scirrhous character. Twenty-four per cent. showed the presence of hyaline degeneration, in some cases very marked and extensive, while 3 per cent. of the hyaline change was confined to the arteries. Twenty-two per cent. of the fibroids were edematous. Nineteen per cent. of the arteries examined were involved with arteriosclerosis, although the slides from many of the specimens were not cut so as to show the arteries, consequently no report is made on the vascular condition in those fibroids. From other studies made especially on the arteries, in uterine fibroids, where block after block was cut to examine the condition of the vessels, I feel quite sure if a study were made for this feature especially, the percentage of arterial degeneration would far exceed these figures. Two per cent. were complicated with sarcoma, while 5 per cent. were of a very cellular type and apparently well on the border line of this malignant complication. Only 1 per cent. was complicated with carcinoma. This is somewhat at variance with the usual statistics, that is about 4 per cent. (3). In explanation of this variation, many of these fibroids had been removed by a supravaginal hysterectomy, consequently one cannot know what the result would have been had there been a com-

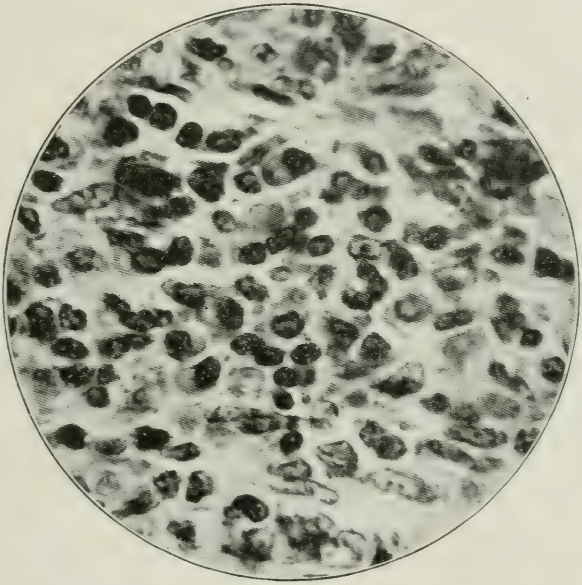

FIG. 3.—Microphotograph of a section of a leiomyosarcoma.

plete removal of the uterus and the cervix searched for early manifestations of carcinoma. It is probable that it would have been greater than the 1 per cent. here reported. Four per cent. of the myomas were complicated with pregnancy.

Seventy-five per cent. of the tumors were of the scirrhus variety. Some of these were of an extremely hard character, almost every vestige of muscular tissue having been destroyed by the contraction of the newly formed connective tissue; others showed some fields cellular while the majority of the slides yielded specimens which were clearly of the scirrhus variety. To form tumors of this type, they must grow slowly, so as to give time for the muscle cells to stimulate the connective-tissue cells to the formation of new fibroblasts with their collagen and fibroglia fibrils. These latter, in undergoing contraction, crowd out the muscular fibers that stimulated their development. If the tumor growth has been more rapid, as in 18 per cent. of the cases of the moderately cellular variety in my study, or still more rapid and lawless as was the case in the 7 per cent. of the very cellular type, little opportunity is given for the development of newly formed connective tissue.

Many investigators have looked upon the lymphocyte as playing a protective influence to the development of carcinoma. Notably among those who have conducted experiments tending to confirm their views are Murphy(4), Norton(5), and Rous(6).

Rous and Murphy contend that an increase in lymphocytes tends to produce an immunity to cancer. The same influence is thought to retard the development of the growth of a leiomyoma by the infiltration of lymphocytes in the tumor. But Sittenfeld(7) takes an opposite view to this proposition and gives the results of some experiments to substantiate his conclusions. He says: "Neither increase nor reduction of the lymphoid element in the blood had any influence upon either resistance or susceptibility to tumor growth."

While the value of the lymphocyte in these tumor growths is of doubtful value, I have recorded their presence in my own study simply as an observation. Twelve per cent. of the specimens showed rather rich lymphocytic infiltration. In my study of 206 cases of cancer, already referred to, this type of infiltration was present in 57 per cent.

Twenty-four per cent. of the cases showed hyaline degeneration, the only significance of which is that these tumors are retrogressive in character.

Edema was present in 22 per cent. of the cases. As a fibroid develops and connective tissue contracts, obstruction to the lymph channels may occur. In come of the specimens, dilatation of the vessels, and in others compression of the veins, results in serum being thrown out into the various intercellular spaces. The practical point associated with this fact is that in examining a fibroid in mass, one may be deceived into believing that he is dealing with a soft variety of tumor when in reality the growth may be of the scirrhus variety, the edema making it soft.

The study showed 2 per cent. of the uterine fibroids associated with sarcoma, which is in accord with the more conservative estimates usually made. Some investigators have placed the percentage as high as fifteen, but my own series of cases would not permit me to add more to the malignant group than already stated. The very cellular ones might be regarded as histologically malignant but clinically nonmalignant. The others gave none of the conditions demanded to make out a sarcoma as detailed above.

TABLE SHOWING TYPES AND CONDITIONS FOUND IN 100 CONSECUTIVE CASES OF UTERINE FIBROIDS.

Very cellular, (molle), per cent.	Cellular, simplex, per cent.	Scirrhus, durum, per cent.	Lymphocytic infiltration, per cent.	Hyaline, per cent.	Edema, per cent.	Arteriosclerosis, per cent.	Sarcomatous, per cent.	Border line sarcoma, per cent.	Carcinomatous, per cent.	Complicated by pregnancy, per cent.
7	18	75	12	24	22	19	2	5	17	4

CONCLUSIONS.

The frequency of sarcomatous association with uterine fibroids in my series of 100 consecutive specimens, is 2 per cent.

The association of carcinoma with uterine fibroids is usually 4 per cent., according to many authors, although in my study of these cases, but one carcinoma was encountered in the entire series.

The fact that 2 per cent. of the 100 consecutive cases of leiomyomata demonstrated the associated malignant condition of sarcoma and that five more of the specimens showed tumors that seemed to be well on to the road of sarcoma, would seem to indicate clearly that uterine leiomyomata show such a disposition to malignant degenerative or associative changes, and more especially when we take into consideration the 4 per cent. liability to carcinomatous association, that it would suggest the importance of the early removal of these tumors.

I desire to express my thanks to Dr. Ernest Scott, Director of the Pathological Laboratory of the Ohio State University, and to Dr. Jonathan Forman, Assistant Professor of Pathology, for many courtesies shown me while making this study.

10 West Goodale Street.

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THE TECHNIC OF TOTAL HYSTERECTOMY FOR NONMALIGNANT CONDITIONS.

BY

RALPH WORRALL, M. D., M. Ch.,
Gynecologist to the Sydney Hospital,
Sydney, N. S. W.

(With three illustrations.)

Recent debates in the medical section of the Royal Society of Medicine, London, and correspondence in various medical journals, go to show that there is still a cleavage of opinion among surgeons whether subtotal or total hysterectomy should be done when the uterus has to be removed for myoma, bleeding or other nonmalignant conditions.

The majority favor subtotal removal on the ground that it occupies less time, causes less hemorrhage, involves less risk, interferes in no way with the attachments of the endopelvic fascia and leaves unimpaired the arch of the vaginal vault of which the cervix is the keystone.

The minority contend that the cervix is frequently infected, lacerated and degenerated, that to leave this part of the uterus under such conditions is to expose the patient to a real risk of cancer development and that apart from such a future danger there is continued ill health from exhausting discharge and reflex irritation so that the patient is apt to say "she has had an operation but is little better."

In the *Medical Journal of Australia* for June 22, 1917, I published a note of three cases of cancer of the cervix following subtotal hysterectomy. In the above-mentioned debate of the Royal Society, London, similar cases were referred to. In my visits to various European clinics I was informed of a number of others. These experiences, coupled with the unsatisfactory condition of many patients in whom subtotal hysterectomy had been done, leaving a diseased or damaged cervix, led me to adopt the practice of resecting every cervix which was not perfectly healthy as a preliminary to subtotal hysterectomy when that operation was required. From this I went on to removing more and more of the cervix from above until I eventually evolved the operation which I now submit as meeting

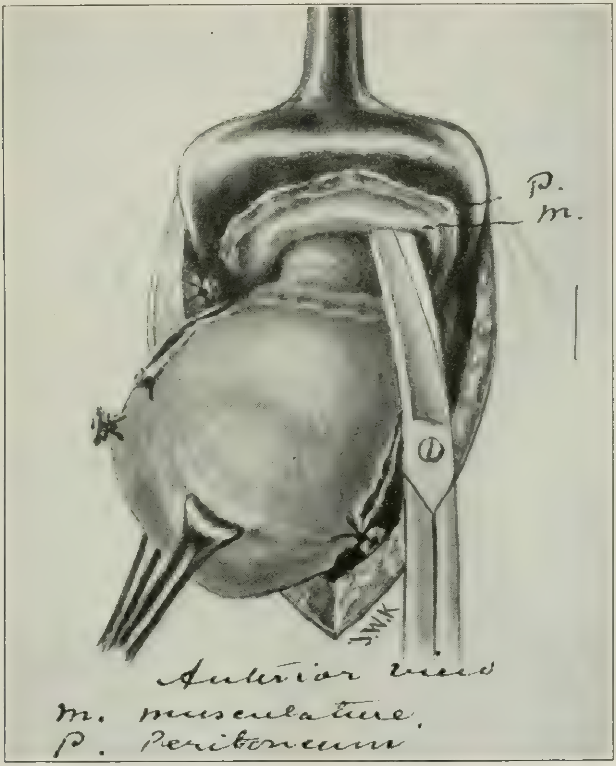

FIG. 1.

all the objections to both total and subtotal hysterectomy as usually performed.

Operation.—After etherization the bladder is emptied, the vagina scrubbed and disinfected, and a syringeful of freshly made tincture of iodine slowly injected into the uterine cavity. In some cases the os is closed with catgut sutures in addition.

The abdomen is opened in the median line, my reflecting retractor placed in the lower angle of the wound, each round ligament held up, clipped and divided. Through the space thus opened up in the anterior layer of each broad ligament the finger is thrust; the vascular arch above the finger containing the ovarian vessels is divided between clips on the uterine side of the ovaries, which are always allowed to remain if healthy. The peritoneum between the cut round ligaments is divided and the bladder dissected down with

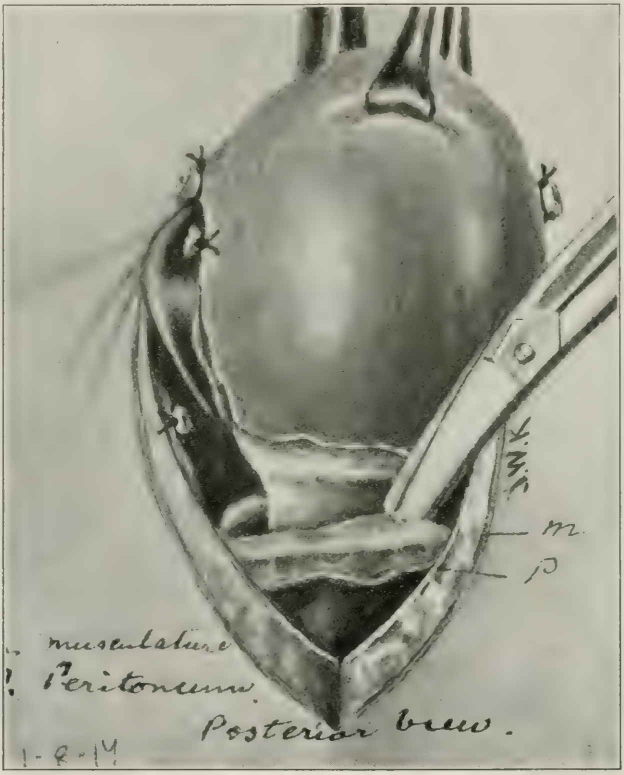

FIG. 2.

the scissors. The uterine vessels, bared of all tissues, are clamped on each side a little below the inner os. With a blunt scissors bent, not curved, on the flat, the musculature of the cervix is then incised all around, penetrating about half way toward the canal; the direction of the cut is then altered from inward to downward until the external os is reached when the circumference of the cut is expanded so as to include all the external os. The mucosa of the vagina is united to the serosa anteriorly by a figure-of-eight catgut suture, the same is done posteriorly; these two sutures are used as tractors by which to pull up the field of operation nearer to the operator.

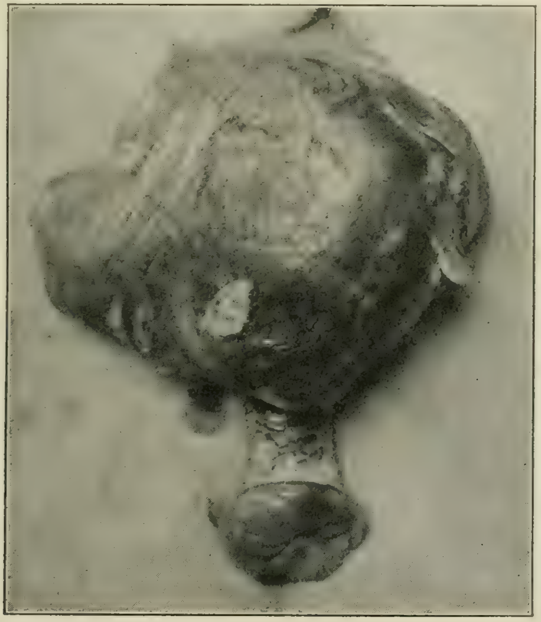

FIG. 3.—Showing uterus removed by Worrall method including lacerated and degenerated cervix

Another figure of eight on each side closes the lateral angles of the opening into the vagina and checks all oozing in these situations and the tying of the two traction sutures closes the central portion of the opening. All artery clamps having been replaced by ligatures, a purse-string suture on each side closes up the broad ligaments, takes in the stump of the round ligaments and unites these to the rim of the cervix. When tied these sutures secure the ovaries perched on the rim of the cervix so that their vascular supply is not unfavorably affected.

When infection is present drainage can readily be made by not completely closing the vaginal opening.

The parietal wound is closed by five tiers of sutures including silkworm-gut passed through all structures except the peritoneum and tied over a fold of gauze which prevents all cutting.

Without any attempt at haste the procedure outlined above can be carried through in from thirty to sixty minutes according to the absence or presence of complications.

Hemorrhage is very slight because the cut is made inside the vessels supplying the cervix. It is also inside the attachments of the uterosacral ligaments and endopelvic fascia. The keystone of the vaginal vault is not weakened. Subsequent examination discloses no vaginal shortening, the firm rim of the cervix can be plainly felt. All glandular epithelium has been removed, there is no longer any danger of cancer development. Convalescence is rapid.

My first operation by this method was performed on June 14, 1914, and the total number of such operations to date is 125, with one death. I am indebted for the illustrations to Dr. J. W. Kennedy, of Sydney.

A STUDY OF THE INFLUENCE OF OXYGEN ON LIVER NECROSIS (CHLOROFORM POISONING).*

BY
HUGH R. SPENCER, M. D.,
Baltimore, M. D.

Necrosis of the liver cells is a common accompaniment of many diseases and varied types of poisoning, prominent among which are eclampsia, acute yellow atrophy and chloroform poisoning.

The lesions in these conditions vary in intensity and to some extent in location; thus, in typical cases of eclampsia the necrobiotic changes are seen to occupy the liver cells in the peripheral or portal vein zone, involving a scant rim of cells or, in other instances, the whole zone. In chloroform poisoning, on the other hand, the destructive changes begin about the central vein and are characterized by hyaline necrosis and a jumbling of the cells of this zone and the accumulation of fat in the midzonal and peripheral regions.

Experimentally, central necrosis can be readily produced, while primary midzonal or primary peripheral necrosis has not been observed under such conditions. The long standing question as to why central necrosis occurs in cases of chloroform poisoning and

* From the Pathological Department of the University of Maryland.

peripheral necrosis is common in eclampsia, has not as yet been answered. Numerous hypotheses have been advanced; thus, Whipple and Sperry(1) in discussing central necrosis in chloroform poisoning, mention the following possibilities:

(1) The periphery of the lobule may be protected by its more efficient bile duct drainage.

(2) The drug may have a specific action upon the liver cells about the center of the lobule.

(3) The lack of arterial blood and the accumulation of waste products in the central vein region may render these cells more liable to injury.

(4) The activity or the intensity of the poison may determine its point of attack. It is thus conceivable that dilute poisons might pass by the peripheral cells, accumulate in the center and attack the cells in this zone, as in chloroform poisoning, while more concentrated or more powerful poisons might attack the cells in the periphery of the lobule, with which they first come in contact and thus bring about necrosis in the peripheral zone, as in eclampsia.

As Whipple and Sperry have said, the view that more efficient bile duct drainage may save the peripheral cells, is disproved by their observation that a dog with complete obstruction of the common bile duct showed typical central necrosis when poisoned with chloroform. A selective action of the drug cannot be accepted as an explanation, for after the central cells have been destroyed, the necrosis is frequently seen to involve the cells of the midzonal region and indeed in some instances, even the peripheral cells are found to have succumbed.

There remains then the possibility that in chloroform poisoning the central necrosis may be primarily due to the action of a dilute poison and accentuated by an accumulation of waste products about the center of the lobule.

In eclampsia, on the other hand, the peripheral necrosis may be due either to a selective action of the poison or, what is more likely, to the immediate action of a concentrated poison.

Irrespective of the location of the lesion, the thought that the administration of oxygen might be of value in such conditions was responsible for the following experiments, the prime object of which was to study the influence of inspired oxygen upon the lethal dose, the length of life and the extent of liver lesion in guinea-pigs poisoned with chloroform. This seemed worthy of consideration in view of certain well known facts in reference to eclampsia, to wit.—its more frequent occurrence in the late months of pregnancy, in primipara, in multiple pregnancy, in hydramnios and in cardiac insufficiency, conditions having to do either directly or indirectly with blood oxygenation, either through mechanical interference with respiration or through poor pulmonary circulation, as in cardiac insufficiency.

In these experiments, Mallinckrodt purified chloroform for anesthesia was used and the drug, instead of being administered by inhalation, was injected subcutaneously. This method was employed so that definite amounts might be given.

The chloroform was diluted with one part of paraffine oil, the oil serving as an indifferent vehicle and tending to reduce to a minimum the ulceration which sometimes appears at the site of injection. As a further precaution, the area of injection was rubbed so that the drug might be dissipated and more readily absorbed. As a matter of routine, a determined number of cubic centimeters or fractions thereof were administered to each hundred grams of animal weight. Two series of animals were used. One was injected and kept in atmospheric air, while the other was injected and immediately placed in an atmosphere containing two parts of air and one part of oxygen (by volume). This mixture was selected after experimentation with normal pigs in varying proportions of the gases, during which it was found that two parts of air and one part of oxygen was the richest oxygen mixture in which the animals could live in comfort. This mixture contained in round numbers about 46 per cent. by volume of pure oxygen, an amount far exceeding that found in atmospheric air.

The animals of the second series were kept in a large sealed glass jar, the mixture of air and oxygen entering by a common tube which extended half way to the bottom of the jar. The exhaust gases escaped through a tube beginning one-fourth of an inch from the bottom, to prevent carbon dioxide accumulation.

The air and oxygen were obtained from tanks of the compressed gases and 200 cubic centimeters per minute per animal, were passed through. The amount was checked up four times daily and thus kept fairly constant. The animals of the second series were fed and cared for like those in series one. Accompanying each set of series two, there was a nonpoisoned guinea-pig as a control. The pathological changes occurring in the organs, especially in the liver, of the animals in both series showed lesions corresponding to those reported by Whipple and Sperry(1), Howland and Richards(2), Opie(3), and Wells(4).

In gross the liver is swollen, pale in color and definitely mottled with red central dots and pale yellowish peripheries. On section the

TABLE I, SERIES NO. 1.

No.	Dose	Result	Remarks
16	0.05 c.c.	Recovered	
17	0.1 c.c.	Recovered	
18	0.2 c.c.	Recovered	
19	0.25 c.c.	Recovered	Ulcer at the site of injection about the fifth day.
6	0.25 c.c.	Dead, 3.5 days	Typical chloroform necrosis, involving from one-half to two-thirds of the lobule. Fatty changes, marked in peripheral zone.
10	0.25 c.c.	Dead, 4 days	Typical necrosis, involving slightly more than one-half of the lobule. Fat accumulation in the periphery is not marked though some is noted.
7	0.5 c.c.	Dead, 1 hour	Organs show no change.
11	0.5 c.c.	Dead, 3.5 days	Hyaline necrosis involves two-thirds of the lobule, this necrotic zone marked cell infiltration with much fat in the periphery.
4	1.0 c.c.	Dead, 8 hours	Liver cells about the center of the lobule, are possibly a little paler than normal. No definite change to be made out.
8	1.0 c.c.	Dead, 3 days	Entire lobule, save a few cells about the portal system, show a marked necrosis. Numerous wandering cells are present—but little fat is seen.
12	1.0 c.c.	Dead, 6 hours	No definite change.
5	1.5 c.c.	Dead, 6 hours	No definite change.
9	1.5 c.c.	Dead, 1 hour	No definite change.

same mottling is noted. Subcapsular hemorrhage and hemorrhage into the periphery of the organ have been described by Whipple and Sperry.

Microscopically, the characteristic lesion is seen about the centers of the lobules, marked by hyaline or bright pink staining cells. The cells usually retain their general contour but occasionally entirely disappear. The nuclei in this central zone of necrosis may stain normally, frequently they are obscured and ofttimes they show

TABLE II, SERIES NO. 2.

No.	Dose	Result	Remarks
23	0.05 c.c.	Recovered	
26	0.1 c.c.	Recovered	
20	0.1 c.c.	Dead, 4 days	Typical chloroform necrosis, involving one-third to one-half of the lobule. A few wandering cells are seen with much fat in the periphery.
24	0.1 c.c.	Recovered	
21	0.2 c.c.	Dead, 3 days	Typical necrosis, one-third to one-half of the lobule involved. Fat abundant in the periphery.
27	0.2 c.c.	Dead, 2 days	Necrosis involves one-half of the lobule, the cells are pale and hyaline. The amount of fat in the periphery is marked.
22	0.25 c.c.	Dead, 2.5 days	Slightly more than one-third of the lobule involved, few wandering cells and an abundance of fat in the periphery.
13	0.25 c.c.	Dead, 3.5 days	Necrosis involves from one-half to two-thirds of the lobule. Cell infiltration and fat accumulation is marked.
28	0.25 c.c.	Dead, 3 days	Typical necrosis, involving about one-half of the lobule, fatty changes in the periphery are not marked.
14	0.5 c.c.	Dead, 3.5 days	Necrosis involves from one-half to two-thirds of the lobule, much fat in the outer zone.
15	Control	Remained healthy	Killed with ether, no change in the organs.
25	Control	Remained healthy	Killed with ether, no change in the organ.
29	Control	Remained healthy	Killed with ether, no change in the organs.

mitotic or pyknotic changes. The necrotic zone is often invaded by wandering cells, common among which are wandering mononuclear cells and leukocytes. In the outer zone or zones the characteristic change is a fatty one, fat droplets abounding in the liver cells toward the periphery.

The other organs may also show changes but these are not constant and are apparently of less importance.

As regards the findings in the animals of Series 1, all those which received doses under 0.25 c.c. per hundred grams weight, survived. One survived a dose of 0.25 c.c., two were killed with a dose of 0.25 c.c. and all animals which had been given a dose of more than 0.25 c.c. per hundred grams weight, succumbed. The minimal lethal dose for animals of this series was, therefore, 0.25 c.c. per hundred grams weight, possibly slightly above.

As to duration of life of animals of Series 1, those receiving a dose of 0.25 c.c. per hundred grams weight lived on an average of three and three-fourths days plus (one animal survived). Of the animals receiving 0.5 c.c. per hundred grams weight, one died in one hour and another in three and one-half days. Those animals receiving larger doses, as a rule, died in a comparatively few hours, though one that had been given 1.0 c.c. per hundred grams weight lived for three days.

As to extent of the lesion in the liver of animals of this series, animals receiving 0.25 c.c. per hundred grams weight showed in their livers characteristic changes involving from one-half to two-thirds of the lobule, while in the animal which received 0.5 c.c. per hundred grams weight, an involvement of two-thirds or more of the lobule was noted.

Of the animals of Series 2, one with a dose of 0.05 c.c. per hundred grams weight survived. Two which had been given 0.1 c.c. also survived; while a third one was killed with a dose of 0.1 c.c. No animal survived a dose of 0.2 c.c. or more. Thus, the minimal lethal dose lies between 0.1 c.c. and 0.2 c.c. per hundred grams weight.

As to the duration of life of animals of Series 2, animals which received 0.2 c.c. lived on an average of two and one-half days, while those receiving 0.25 c.c. lived on an average of three days.

As to the extent of the liver lesion, animals receiving 0.2 c.c. per hundred grams weight showed an involvement of from one-third to one-half of the lobule, those receiving 0.25 c.c. showed involvement of from one-third to two-thirds of the lobule, while those receiving a dose of 0.5 c.c. showed involvement of from one-half to two-thirds of the lobule.

CONCLUSIONS.

1. The inhalation of air mixtures rich in oxygen produces no appreciable change in the livers of normal guinea-pigs.

2. The administration of such air mixtures rich in oxygen reduces the minimal lethal dose of chloroform.

3. The administration of such mixtures brings about a slight reduction in the length of life, but apparently has little to do with determining the extent of the liver lesion.

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THE IMPORTANCE OF AN EYE-GROUND EXAMINATION IN INFANTS AFTER DIFFICULT DELIVERY WITH OR WITHOUT THE AID OF INSTRUMENTS.

BY

J. A. KEARNEY, M. D.,

Adjunct Professor of Ophthalmology New York Polyclinic Medical School and Hospital, New York City.

INTRACRANIAL hemorrhage at birth is responsible for 70 per cent. of the spastic type of paralysis in children and 20 per cent. of the resulting idiocy and feeblemindedness now existing. With the knowledge of these statistics, it is a prime consideration of the present-day obstetrician whether to do an abdominal section in selected cases or to allow the woman to fall into labor; if he decides that labor should take place, then every means must be employed to facilitate it so that any injury to the infant's cranium and its contents be minimized.

In spite of all the modern perfections in accouchment there will occasionally occur a case in which the obstetrician in charge, may be convinced that grave injury has been done to the infant's intracranial tissues whether instruments were or were not used in the delivery. In this event, every sign and symptom should be studied most carefully as soon as possible after the birth of the child to determine any untoward neurological phenomena that might result. Probably the most damaging factor in these cases is that of an increase in the pressure of the cerebrospinal fluid as the result of the presence of an intracranial hemorrhage.

One of the earliest indications of the existence of increased intracranial tension is determined by a direct-method ophthalmoscopic examination of the fundus of the eye. Here may be seen in the event of the usual amount of intracranial hemorrhage, a mild edematous blurring of the upper and lower margins of the disc and the nasal half of the disc and its margins in the first few days after the birth of the child or later on an edematous blurring of the entire surface of the nerve head and all its margins; the blurring being more pronounced on the nasal half of the disc and its margins. However when massive intracranial hemorrhages occur then gross edematous changes may take place quite early; a measurable edema confined to the nasal half of the disc or a measurable edema confined to the entire disc, papilledema. If these eye-ground changes are noted and at the same time there is an increase in the pressure of the cerebrospinal fluid determined at lumbar puncture by the spinal mercurial manometer, whether or not convulsions or other signs and symptoms are recorded; then in certain selected cases a simple cranial decompression operation to remove the hemorrhage would be indicated. All suspected infants should have as soon as possible after birth a careful ophthalmoscopic examination of the fundus oculi and a lumbar puncture made. One thousand three hundred eighty-seven children having spastic paralysis with or without mental impairment, of ages varying from one day to twenty years have been examined with the ophthalmoscope to ascertain the presence of increased intracranial pressure due to hemorrhage and of this number 287 children have shown the distinct edematous changes above described or in the regressive stages; that is in about one child in five examined, the condition is due to an intracranial hemorrhage. Naturally these children are the only ones that can be benefited by any cranial operation.

The history of these 1387 patients has been most instructive. Of the 619 children whose physical and mental impairments were diagnosed as being the result of lack of development of cortical or pyramidal tract nerve tissues, 38 were not premature babies, and only 64 were not born after a number of pregnancies; that is, the impairment of nerve tissue in these cases was due either to insufficient time for its proper development and growth as in the premature babies of the seventh and eighth months, or to a less active growth of the nerve cells themselves, as occurs in children following a large number of pregnancies, where the mothers become malnourished and physically less vigorous. Naturally, none of these children showed signs of an increased intracranial pressure. Syphilis was demonstrated to be a possible active etiological factor in the condition in only 23 children (that is 1.7 per cent.) of the entire number of 1387 patients examined; a Wassermann test both of the blood and cerebrospinal fluid has been made in each child; in doubtful cases a cell count of the cerebrospinal fluid has also been utilized, and also the blood of the parents examined; in two instances the cerebrospinal fluid of the parents was examined but with negative results.

Of the 451 cases diagnosed as being the result of a former meningitis and meningoencephalitis, the history of an acute illness associated with high fever was present in each case except 52; convulsions had occurred in all but 54 of them. The child had been apparently normal until the day of the acute illness, whether it was ten days after birth or two or three years. Following the sickness, it was noticed that one side of the body could not be used as well as the other, and then gradually a stiffness of the arm and leg occurred. The convulsions persisted in 281 of these cases, and they were all very unstable children emotionally. When the spastic paralysis followed an acute infectious disease such as measles, whooping-cough, and scarlet fever, these cases were usually of the hemiplegic type and undoubtedly many of them were of thrombotic origin; convulsions usually occurred at the height of the fever, but in many cases they did not continue for more than two or three weeks. Those cases following cerebrospinal meningitis were usually of the diplegic and paraplegic types and in several of them there were mild signs of an increased intracranial pressure, undoubtedly due to an edematous condition of the brain resulting from the convulsions. Of the total number of 1387 children examined, only 294 were diagnosed as being the result of an intracranial hemorrhage at or near the time of birth; that is, 21 per cent. of these cases of cerebral paralysis showed definite signs of an increased intracranial pressure, and these are the cases and the only ones that can be improved by lessening this intracranial pressure. Naturally, the earlier the diagnosis is made after birth and an operation performed to relieve the intracranial pressure, just so much better is the ultimate prognosis. In the new-born infants under ten days of age, not only will the operative procedure lessen the intracranial pressure directly, but it will afford a means of drainage of the blood, whereas in the older children the operation is performed merely to offset the pressure of the former hemorrhage. If possible its resulting cystic formation or fibrous mass is removed, but this can rarely be accomplished owing to the great danger of injury to the underlying cortical nerve cells. This operation of cranial decompression and drainage has now been performed by Dr. Sharpe upon 287 children, with a mortality of 29, that is, about 10 per cent. Their ages have ranged from two hours to twenty-four years; 9 babies were operated upon the first day, with a mortality of 1 (due to the hemorrhage being subtentorial about the medulla), while 6 of the remaining 8 children are apparently normal in every way; 6 babies were operated upon the second day after birth, with no mortality, and 3 on the third day, also with no mortality. Naturally this early diagnosis and operation is the ideal time for the best results to be obtained, for at this early date the supracortical blood can be drained away and the cortical nerve cells be thus spared from the superimposed pressure of the hemorrhage. The diagnosis at this early date is easily confirmed by the presence of blood in the cerebrospinal fluid at lumbar puncture; the fundi of the eyes will show only mild signs of pressure at this early date until the hemorrhage is very large.

Some points in the history of these 287 operated patients have been interesting and instructive; only 39 of them were not first children; only 11 were not full-term babies; only 27 were not born with difficulty—instruments being used and particularly high forceps in a large percentage of them; only 61 did not have convulsive twitchings immediately after birth, and in only 38 children was the spasticity noticed before the eighth month after birth. Of these 287 operated patients, 149 were hemiplegic, 51 paraplegic and 87 diplegic. Many of these cases which were operated upon during the first year of this work, in 1913, were the extreme types of the condition—derelicts as it were, and so badly impaired both mentally and physically that only a slight improvement, if any, could be expected in the older cases; the average age of the first 65 operated children was six years and many of them had never walked nor talked. Naturally, cases of this age and of this extreme type can, at best, be only improved; their cortical nerve cells have become so impaired from the overlying hemorrhage that any marked return of function is very doubtful. Yet, even in some of these older extreme cases the improvement has been most striking; seven children, who had never walked and each of them over eight years of age at the time of the operation in 1913, are now walking. In the younger children, however, the results have been most gratifying and it is in these children under three years of age that the greatest amount of improvement can be obtained by an early operative procedure. Not only has there been a lessening of the spasticity of the arms and legs affected in these cases selected for operation, but there has been a definite amelioration of the mental condition of the patients to such a degree that in the older children their coöperation in the carrying out of the after-treatment can be obtained; this is a most important aid in the physical training of the child.

A written permission for autopsy is obtained in each case (private or ward) before operation; in this manner, if the patient should die, then not only will the cause of death be ascertained but the accuracy of the diagnosis and other valuable data for the treatment of similar patients. Of the twenty-nine patients who died, an examination of the brain was made in each case and in all of them with the exception of one case the diagnosis of an intracranial hemorrhage was confirmed.

Moving pictures have been taken of a large number of these patients before operation, and then at intervals of six months following the operation. In this manner the lessened spasticity and the resulting improvement of gait can be accurately demonstrated and recorded.

The Binet mental tests have been used both before operation and at regular intervals following the operation; the mental improvement of many of the children has been most impressive.

If in some of the infants suspected of brain injury by the obstetrician just one was found occasionally that showed definite signs of a subdural hemorrhage as determined by an ophthalmoscopic examination of the fundus oculi and verified by a lumbar puncture, and this hemorrhage was removed by a simple cranial decompression operation as soon as possible after birth, the earlier the better, it would be well worth while to know that one human was saved the fate of a spastic child and of an imbecile.

127 West Fifty-eighth Street.

INDICATIONS IN OBSTETRIC SURGERY.*

BY

E. M. LAZARD, M. D., F. A. C. S.,

Los Angeles, California.

In a recent article, J. Whitridge Williams(1) sounds a warning against the "*furor operativus*" which seem to have overtaken the profession in the reckless and frequently inopportune performance of Cesarean section. He attributes it to defective medical training. This, I believe to be true and to be the crux of the whole situation. Not only does it apply to Cesarean section, but to all obstetric operations. Wherein is the fault in the medical, or rather obstetrical, training of our students and practitioners? Unfortunately, only a comparatively few favored ones are privileged to take a clinical hospital course under some of the masters of the obstetric art. The vast majority are dependent on their college teaching, supplemented by further reading in text-books and medical journals. The fault, I believe, is in the manner in which we teach and in which our text-books treat of indications, necessary conditions, and contraindications in operative obstetrics.

This criticism applies to Williams' text-book, no less than to all of the others. Our students are not trained to think obstetrically.

In reading over the indications for forceps, podalic version, Cesarean section and other operative means of delivery in something over a dozen different text-books in my library, my wonder grew, not that there is so much poor and ill-advised operating, but that there is not more. For, in these various books, whose authors are acknowledged authorities, the same conditions are named as "indications" for various extractive operations. Indeed, one could find authority for almost any operative attack in a given condition. For instance, as indications for forceps extraction are given, all conditions endangering the life of mother or babe, by almost all the authors(2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14). The same conditions are given as indications for podalic version and extraction by some(3), (5), (6), (7), (8), (11), (12), (13). Most of them qualify this class of indications for version by such statements as—"if the natural course of the head presentation is less favorable to mother or child than the artificially produced breech"(3), "where breech is more favorable for delivery"(4), "provided forceps delivery is not safe or practicable"(5), "where the head is floating or but slightly engaged"(7), all of which is equivalent to saying: "where forceps is contraindicated and version indicated." Several authors(6), (9), (11) give disproportion between head and pelvis, and malpositions or malpresentations as indications for forceps, conditions which, *per se*, should be considered contraindications to forceps.

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* Read at meeting of Los Angeles Obstetrical Society, October 9, 1917.

The lack of proper obstetric thinking is accentuated in one text-book on operative obstetrics(9) in the statement "where the head is high up and reposition and *forceps have failed*, version is indicated." And, another(8) gives version as being indicated "where there is impaction of the fetus with great distention of the lower uterine segment and threatened uterine rupture." Again, we have obstetric indications made easy by one author(11) who gives as a good "rule of thumb" to guide the obstetrical practitioner the following: "Apply forceps in head presentations wherever the presenting part remains stationary for two hours in the second stage of labor." It appears to me that anyone who tries to draw his indications for forceps by any "rule of thumb" is a rather unsafe individual to entrust with an instrument of such dangerous possibilities as the obstetrical forceps. We can readily imagine the results were such a one to apply forceps to the head which had remained "stationary for two hours in the second stage" because of highly contracted pelvis, brow, posterior occiput, face, hydrocephalus, obstruction from tumor, etc. To be sure, there are discussions in the text of all of these books which would enable one to decide whether there were present "the necessary conditions" to really indicate the operation in question, or some other.

But, the "indications" for a given operation, especially, as they are usually emphasized in the text, are most likely to be impressed on the student's mind and the other conditions necessary to determine the particular operative procedure are not likely to be given the consideration which they deserve. In other words, the student is encouraged to memorize "indications" and base his operative judgment on them, rather than on proper obstetrical thinking and reasoning.

When we read in recent literature such articles as "The Rôle of Abdominal Cesarean Section in the Treatment of Eclampsia"(15), "A Consideration of Vaginal Cesarean Section in the Treatment of Eclampsia, etc."(16), it is small wonder that a "*furor operativus*" has seized the profession and the result is illustrated in the case cited by Williams of the surgeon who did a Cesarean section on an eclamptic multipara whose os was more than half dilated.

Nearly all the text-books name under indications for a given obstetrical operation, all conditions in which the given operation may eventually become indicated. Under "necessary conditions," they then give the conditions which really indicate the operation in question. This, to my mind, is illogical, and leads, I believe, to improper obstetrical thinking, which has as its results, premature and improper attempts at operative delivery. Certainly, the results which we see, hear and read of, in the way of operative work in obstetrics, would seem to bear out this statement.

Some years ago, in speaking to a fellow practitioner of a case of eclampsia in a multipara, eight months pregnant, I said I had done an instrumental dilatation of the os, podalic version and extraction. He immediately asked: "Why podalic version and extraction and not a forceps delivery?" The fact that the patient was a multipara, only eight months pregnant, evidently did not impress him, he merely had in mind the fact that "eclampsia is an indication for forceps." To-day, I presume the question would be: "Why not a Cesarean section?" This line of reasoning, or lack of reasoning, is, I believe, due to the method of handling the subject in teaching and in text-books, in short, herein lies, in great part, the defective obstetrical training to which Williams refers. So, for several years, I have endeavored to teach operative obstetrics to my students in an entirely different way; one which, I believe, trains them to think obstetrically. Thus, I hope they will learn to base their operative work on obstetrical reasoning, rather than to depend on memorized indications, frequently ignoring the "conditions necessary."

A brief outline of this plan, I would like to present for your consideration.

By indications, I understand and mean, conditions which require or make advisable a given operation. By contraindications, I understand, conditions which make an operation dangerous and inadvisable. By "necessary conditions," I understand and mean, local conditions which must be present and can be obtained before proceeding to the indicated operation; but, whose absence does not contraindicate the operation in question but rather indicates the necessity of some procedure to bring about the required condition before proceeding to the indicated operative extraction.

Indications, I divide into three classes:

1. Those conditions which determine the necessity of operative interference; which call for the termination of pregnancy or labor.

2. Those conditions which indicate the necessity of operative procedure to prepare the passage or passenger for the operative extraction.

3. Those conditions, which indicate the particular operative extraction which is to be performed.

The first class of indications is composed almost entirely of general conditions, indicating danger to mother or child. Such conditions of the mother as pulmonary tuberculosis, advanced heart disease, pulmonary edema, nephritis, exhaustion of the mother from prolonged labor, eclampsia, etc., and of the fetus, of increasing or decreasing heart rate, escape of meconium in head presentations, prolonged pressure on the fetal head, as evidenced by increasing caput succedaneum, etc., give indication for the termination of pregnancy or labor, rather than for the particular operation or operations by which it is to be accomplished. Yet, nearly all the authors give these conditions as indications for forceps, and then proceed to discuss whether forceps, version or some other method of delivery is really indicated in a given case.

In the second class of indications, those which indicate the necessity of some operative procedure to prepare the passage or passenger for delivery, we have:

(*a*) The indications for operation on the bony pelvis in case of moderate contraction, such as pubiotomy. In considering this class of indications, we have to deal with the question as to whether the pelvic deformity is of such degree as to contraindicate delivery *per vias naturales* and to indicate or make preferable delivery by Cesarean section. (The absolute and relative indications.)

(*b*) The indications furnished by the os, if it is not completely dilated, it must be dilated by operative means. If the case be one of terminating pregnancy, and time permits us to initiate normal labor, we may introduce bougies, bags, or pack the cervix, etc. If the urgency be great, however, as in the case of placenta previa or abruptio placentæ, or if the cervical conditions are too difficult to overcome, manual or instrumental dilatation, vaginal hysterotomy or Cesarean section may be indicated. If the case be already in labor and pathological conditions of the cervix render normal dilatation unusually difficult, or conditions arise which indicate the necessity of terminating labor before complete dilatation of the os, we have to decide between manual, instrumental or bag dilatation, deep cervical incisions and vaginal hysterotomy. Here, I would like to say a word against the requirement, as laid down in most of the text-books, that "the os must be completely dilated *or dilatable*" before proceeding to an operative extraction. To my mind that requisite condition should read "the os must be completely dilated" to emphasize the necessity of having the os completely dilated before proceeding to the indicated extraction.

(*c*) The condition of vagina and perineum, indicating the possible necessity of thorough dilatation or a possible episiotomy.

(*d*) The presence of obstructing tumor, which may indicate the necessity of Cesarean section.

(*e*) The indications furnished by the fetus: Malpositions and presentations which may indicate the necessity of some form of version on the head or podalic version to favor the normal course of labor, or permit of rapid extraction by operative measures; or in case of fetal malformations or of neglected malpresentations or positions, which may necessitate a mutilating operation on the child.

The third class of indications comprise those conditions which indicate the particular operative extraction to be done. Here our conditions will indicate forceps, version, or perforation and cranioclasm, where delivery *per vias naturales* is indicated.

In a given case, then, our consideration will take the following course: Are conditions present indicating the necessity of terminating pregnancy or labor? That being the case, is delivery *per vias naturales* possible or preferable? This indication is furnished by the relative size of passage and passenger, and the presence or absence of an obstructing tumor.

In case of imminent danger to mother or child, as by placenta previa or abruptio placentæ, conditions indicating a pelvic delivery may possibly be ignored and the case treated surgically by section as giving a better prognosis than by the slower obstetrical method with increased danger to both patients.

Here, too, come into consideration the so-called border-line cases, and an operation to enlarge the pelvic girdle, such as pubiotomy, may be indicated. However, it is not my purpose to enter into a discussion of all obstetric surgical problems in this paper.

Delivery *per vias naturales* being indicated, we have next to consider the condition of the os. Is there sufficient opening to permit of delivery, and if not, what operative procedure is indicated? The os being completely dilated, either naturally or artificially, we have finally to determine the method of extraction indicated.

Forceps and podalic version should not, at least theoretically, be considered as competitive extractive operations in a given case. Conditions which indicate the one, contraindicate the other and *vice versa*. Practically, however, our diagnostic ability is, at best, but humanly fallible, and it may be justifiable in what might be called a border-line case, to tentatively try forceps and in case of a mistake in judgment, based on an error in diagnosis, proceed to a properly indicated version. But, to make failure in a forcep attempt the indication for a version, as one text-book does, seems to me to be illogical and conducive to dangerous operative attempts. Forceps are indicated whenever it is necessary to terminate labor and the head is well engaged in the pelvis in proper position. Where the head is just engaging in the brim in a malposition, such as posterior occiput, face, brow, or parietal presentation, and the indications for terminating the labor are present, I believe podalic version and extraction are the indicated procedures. Where possible a version on the head to correct the malposition or presentation and then forcep extraction, may be the operation indicated. Podalic version has, however, served me best in these cases.

If the head is floating or but poorly engaged, forceps are contraindicated and podalic version indicated. Some authorities give forceps on the floating head, as one class of forceps operation. This, I believe, to be vicious teaching, and, where followed, I can readily see how forceps can become the "bloodiest of instruments," as one authority has characterized them.

We find in some text-books moderately contracted pelvis and malpositions and presentations of the head given as indications for forceps. These conditions should, *per se*, be classed as contraindications to forceps delivery. I believe they are most frequently indications to leave the patient alone and allow nature to overcome the difficulty. This, she can do far better than we can by forcible attempts at extraction which then become mere exhibitions of brute force to overcome the resistance, with consequent damage to the maternal soft and bony parts and to the fetal head.

It is true that in overcoming these difficulties, Nature may wear the woman out or the baby may be endangered and then termination of the labor is indicated. The malposition or malpresentation having been corrected by Nature's efforts, or the disproportion having been overcome by molding of the fetal head, forceps may be indicated to save a threatened maternal or fetal life. If urgent necessity for the termination of labor arises before Nature has had a chance to correct the difficulty, then we must correct it by the resources of the obstetric art, by version on the head, podalic version, operative enlargement of the pelvic girdle or by a mutilating operation on the child to reduce the disproportion, before we proceed to the extraction. Or, in case of extreme urgency, we may be justified in cutting the Gordian knot of our obstetric difficulty by a Cesarean section, provided it is not contraindicated. But, this way out of our obstetric troubles should be reserved for the last resort, rather than be the first refuge, which, unfortunately, now seems to be too often the case. By that, I do not mean that we should wait until the patient is exhausted by prolonged labor and possibly other operative attempts have been made, thus contraindicating section, but rather that we should carefully consider the case in all its aspects and only resort to section, when it seems to offer the best chance, after all other methods have been carefully considered.

Forceps extraction should not be a difficult operation to perform. Whenever I hear of a difficult forceps extraction, taking one, two or more hours, and tiring out two or three men, I know that that operation was not properly indicated or was not skillfully performed. I say this even though I have had this experience in the past years on a few occasions. In each instance, I have been able to determine where my mistake in judgment lay, and, as my experience has grown, these errors in judgment are becoming rarer. A properly indicated and performed forceps operation, whether it be high, median, or low, should not take at the maximum more than one-half hour and the vast majority should be terminated in from ten to fifteen minutes. This should be accomplished without the exhibition of undue force and with intervals of rest between the tractions.

Since the advent of the obstetrical forceps, podalic version has been undeservedly relegated to a secondary place as an operation precedent to extraction. It has come to occupy the place of a sort of assistant to forceps, to be used only where the forceps is not available. This is due partly to the fact that, before the invention of forceps, podalic version offered the only possible way of accomplishing delivery of a living child in difficult cases, the only alternative being a destructive operation on the child, as Cesarean section was so dangerous as to have a prohibitive maternal mortality. As a result, it was often attempted in cases where it was contraindicated, and with disastrous results. But with the perfection of the forceps as an extractive instrument, podalic version has come to occupy a secondary position.

Such indications for version as the following: "In cases where it is more favorable than forceps," "When forceps have failed," "Where conditions are not favorable to forceps," tend to make the student consider version as an operation only to be done when forceps are unavailable. The result is that if one speaks of an operative extraction, I venture to say fully 90 per cent. of doctors will immediately think of forceps and many of them will think of Cesarean section as the operation of election in difficult cases. Possibly 10 per cent. of doctors will want to know more of the obstetrical conditions and will give version its proper consideration. It seems to me that podalic version and extraction should be given their proper place as a means of delivery and should have their indications as sharply drawn as those for forceps.

Podalic version is indicated in transverse and oblique presentations and where there is prolapse of cord or small parts. In certain cases of placenta previa, podalic version is indicated, not as a precedent to extraction, but rather as a method of controlling hemorrhage and then allowing the labor to be spontaneously concluded. Where the termination of labor is indicated and the head is floating or but slightly engaged and especially in malpresentations and malpositions such as posterior occiput, brow, face, and parietal presentation, podalic version is the properly indicated procedure.

The mutilating operations on the child are only indicated in three classes of cases:

1. In neglected or maltreated cases, such as neglected shoulder and transverse presentations; or where the uterus has been allowed to become tetanically contracted in the presence of some disproportion between passage and passenger, either actual or relative.
2. In fetal malformations such as hydrocephalus, and
3. Where the fetus has died in the course of some difficult labor, a mutilating operation may offer the quickest and safest way to terminate the labor.

To recapitulate: I believe the "furor operativus" to which Williams calls attention, as well as the great amount of ill chosen and poorly executed operative attempts, are due to defective obstetrical training, as he points out. This, in turn, is due in great measure, I believe, to the manner in which practically all of our text-books treat operative indications. When our text-book authorities include among indications for an operation all conditions in which such procedure may eventually become indicated, but some of which in themselves, should be considered contraindications, I believe the young practitioner is not to be too severely censured if his treatment evidences poor obstetrical judgment and is disastrous to his patients.

In teaching students, I believe we should give them the indications:

First, for terminating pregnancy or labor;

Second, for the operative preparation of passage and passenger for the extractive operation, and

Third, for the particular extractive operation to be performed.

The first class of indications are furnished almost entirely by general conditions endangering the life of mother or babe, the second and third classes, those determining the particular operation or operations to be done, are furnished by the local obstetrical conditions prevailing.

By following this plan, the student is trained to think obstetrically and this will result, I hope, in less operating and better planned and executed operations, where they are properly indicated.

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602 BROCKMAN BLDG.

MATERNAL AND FETAL BLOOD DURING PREGNANCY AND THE PUERPERIUM.

BY

WM. D. FULLERTON, M. D.,

Cleveland, Ohio.

It became apparent quite early in the preparation of this paper, that considering the time alloted for presentation I would necessarily be confined to a statement of facts. The subject is so exhaustive that I have attempted to summarize under several headings the most important studies, and have appended at least a working bibliography for those particularly interested in any one phase.

CYTOLOGY.

Since the time of Morgagni the condition of the blood during pregnancy has been a debated question. Until the more refined methods of examination were possible, no marked variations were noted. Slemmons has shown that the body stores water during pregnancy and that preceding labor there is a marked diuresis. Cragin(1) states that there is a moderate hydremia with a lowering of the specific gravity, especially in the latter months. Thompson(2) found the high specific gravity (1.053) in early pregnancy decreased toward the middle to 1.040, after which it again increased to normal, 1.053 at term. The fibrin content is increased, the albumin content decreased(3), and the freezing point lowered(4).

The red blood cells which normally show no change in morphology(5) are slightly decreased in number during early pregnancy, subnormal throughout the middle months, and approach normal as labor draws near. The hemoglobin ranges from 66–67 per cent. until the seventh month, then rises to 85 per cent. between the eighth and ninth month. The hemoglobin of new-born children is high, averaging 105 per cent.

There are about 500,000 more red corpuscles per c. mm. in the blood of the new-born child than in adult blood. During the first day or two there appears to be an increase in their number, which is probably accounted for by the loss of volume due to dehydration.

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*Read at a meeting of Practitioners' Medical Society, Columbus, O., October 11, 1917.

At birth nucleated reds are seen about once for every fifteen white cells. Within a week they have disappeared. The earlier in pregnancy the fetal blood is examined the more nucleated reds it is found to contain(52).

After the second or third day of life there is a gradual decrease in the number of red cells, so that after ten days the number is about 500,000 per c. mm. less than at birth. This process consists of an hemolysis and is probably responsible for the icterus of the new-born(53).

There is a much greater variation in the behavior of the white blood cells. All observers agree that there is a leukocytosis which appears late, about a month before term, being greatest during labor, at which time Baer(6) found an average of 18.255. The first ten days of the puerperium usually show a return to normal, though the leukocytosis may persist for three weeks. The averages by Cragin were 10,600 during pregnancy, 12,800 during labor, 11,700 on the third, and 10,300 on the tenth day of the puerperium. The leukocytosis is principally due to the increase in the polyuclears, although the other cells may show some slight increase. Parity, rather than age, influences the count which is most marked in primipara, less in ii-para and slight by the time they have had three children. Long or especially painful labors increase the count which is not influenced by lactation.

The white blood cells of the new-born child increases during the first few days to as many as 23,000, averaging 10,000 to 12,000, with the polynuclears in the majority, which position is later taken by the lymphocytes.

The blood platelets normally number 200,000 to 400,000, averaging 250,000 per c. cm.(7), (8). At the time of labor, however, Rebaudi(9) found they are increased to 1,500,000, then fall rapidly after delivery to 600,000. The protective mechanism of such a change will be shown when speaking of coagulation.

SPECIFIC BLOOD DISEASES.

Pernicious Anemia.—Special credit is due Channing(10), who in 1842 tabulated seventeen cases, none of which showed symptoms until days or weeks after delivery. The condition is very rare, occasionally developing during pregnancy, but usually not until after delivery. Repeated pregnancies, malnutrition, overwork and infection may be etiological factors, but the cause is yet unknown. The symptoms are marked pallor, anemia, weakness and shortness of breath, which, with the characteristic blood picture, are diagnostic(11). If the condition develop during pregnancy the fetus usually dies in utero. The fetus has never been found to show the blood picture of the mother, which shows that the characteristic cells are neither formed in the fetal body or transmitted to it through the placenta.

Leukemia.—The several leukemias are also very rare complications. The condition may exist before pregnancy though it usually develops after its inception(12). There is no effect on gestation though the two conditions may seriously affect the mother. Maternal improvement has been noted after premature labor so that therapeutic abortion is justified(13). Neither Sanger(14) or Cameron(15) found any characteristic leukocytes in the fetal blood, so they are neither formed simultaneously in the fetus or transmitted through the placenta. The blood picture with leukocyte changes is diagnostic.

Malaria.—Pregnancy seems to aggravate malarial attacks and to encourage exacerbations of a quiescent infection. Abortion not infrequently occurs. The specific parasites are most easily found in blood smears from the maternal surface of the placenta, especially after the third month. Without injury to the placenta parasites are not found in the fetal circulation(16).

Lead Poisoning.—Chronic lead poisoning is a potent cause of sterility amounting to 20 per cent. among lead workers. Abortion occurs in 65 per cent. of women with lead poisoning, and only 10 per cent. of the children born reach ten years of age. The lead absorbed by the mother is transmitted by the placenta to the fetus, Lewin(17) finding it constituted 16 per cent. of the total weight of the liver of premature children. Stippling of the red blood cells is characteristic in maternal and fetal blood.

NONPROTEID NITROGEN AND OTHER ELEMENTS.

Nonproteid Nitrogen.—The ability of the kidneys to eliminate nitrogen has for some time been recognized as an excellent indicator of their functional capacity. Williams laid stress on the importance in toxic vomiting of pregnancy, of the urinary nitrogen coefficient, that is, the percentage of total nitrogen eliminated as ammonia. Normally this constitutes 4–5 per cent., but in toxic vomiting ranges from 10 to 40 per cent. Others, Underhill(18) in particular, have shown that similar results may be obtained by starvation.

Plass(19) studied the partition of the nitrogenous products in the blood stream during different periods of pregnancy both normal and abnormal. He divided them into those coagulable, serum albumin and serum globulin, and those not coagulable, urea, creatin, lecithin and ammonium salts, etc. The noncoagulable nitrogen in the blood has been studied by Zangemeister and others, and Plass determined the total nitrogen as well as the noncoagulable nitrogen and expressed the latter in per cent. of the former. The results with normal blood showed 9.3 grams per liter as the low limit for the total nitrogen; 0.42 grams per liter to be the upper limit for noncoagulable nitrogen, and 3.9 per cent. the upper limit for the noncoagulable nitrogen coefficient.

A group of patients with toxemia without convulsions showed an average of 8.69 grams of total nitrogen per liter; 0.425 grams of noncoagulable nitrogen and a coefficient varying from 3.97–5.84, averaging 4.93. In all cases the total nitrogen was below normal, the noncoagulable nitrogen increased and the coefficient markedly increased.

Another group of true hepatic eclamptics all showed figures within normal limits. This shows a striking difference in those patients suffering from true eclampsia and those with so-called toxemia which is usually kidney in origin. This is in accord with Williams' views that true eclampsia is a liver disease with but little disturbance of kidney function, whereas nephritic toxemia shows no hepatic change but a marked renal change with pronounced dimunition of functional capacity.

The conclusions are that the noncoagulable nitrogen coefficient of the blood is a better index of renal function than the total noncoagulable nitrogen of the blood, and that in pregnancy it helps differentiate renal and hepatic toxemias.

Slemmons and Morriss(20) found that in normal obstetrical cases the average rest nitrogen of the mother was 25.2 mg. per 100 c.c. of blood and 24.9 mg. for an equal amount of fetal blood. The maternal urea nitrogen was 10.5 mg. per 100 c.c. and 10.4 mg. for the fetus. The urea nitrogen equaled 44 per cent. of the maternal and 45 per cent. of the fetal rest nitrogen.

The same concentration of urea in both circulations indicates that this substance passes through the placenta by diffusion, and as would be expected, complications accompanied by an increase of urea in maternal blood, such as toxemias, syphilis and broken cardiac compensation, show a corresponding increase in the fetal blood.

Amino-nitrogen.—The amino-nitrogen of the blood of normal men has been found to be 4–8 mg. per 100 c.c.(21). In none of the ten eclamptics examined was the amino-nitrogen of either blood or urine found to vary from the normal(22).

Creatinin.—The total creatinin content of normal serum is 1.6–2.1 mg. per 100 c.c. In renal insufficiency creatinin of the blood is found increased to 3.5 mg. per 100 c.c. if the amount exceed 5.0 mg. the condition is very serious. No increase is found without renal insufficiency. Plass(54) has found equal and normal amounts in both maternal and fetal plasma and serum. Here again is evidence of simple diffusion through the placenta.

Fat and Cholesterin.—A progressive increase in the blood cholesterin is found during pregnancy reaching a definite hypercholesterinemia at term, which usually drops to normal within ten days(23). A marked increase is also found in typhoid patients. This common finding suggests a reason for the frequency of cholelithiasis after both typhoid and pregnancy(24). Maternal blood shows 2.19, and fetal blood 2.1 parts of cholesteral per 1000. The total lipoid content of maternal blood is 4.75 parts per 1000, whereas the fetus show 4.8 parts per 1000. These slight differences are attributed to the discriminating function of the chorionic villi(25).

Sugar.—The normal amount of blood sugar varies between 0.04 and 0.12 per cent., averaging 0.084 per cent.(26). Lewis and Benedict have recently raised the lower limit to 0.09 per cent. It varies with the carbohydrate intake and is lowest before breakfast. The blood sugar may be high though there is none in the urine. This occurs when there is renal involvement. During normal pregnancy there is a lowered sugar tolerance although the blood sugar is normal. This is also true during the puerperium(55). During the puerperium lactose frequently appears in the urine. This sugar cannot be used unless changed by intestinal enzymes and is therefore eliminated in the urine. Blood sugar, normal at the onset of labor, is increased (0.132 per cent.) at the time of delivery. This is accounted for by the muscular exertion as well as the anesthetic, both of which are followed by a definite increase. In eclamptics the sugar content of the blood was found high, 0.16–0.27 per cent., though this was not constant. This is particularly true immediately after convulsions(27).

The blood sugar in pregnant diabetics has not been sufficiently studied to make any definite statements. Emptying the uterus has no effect and there is no recognized relation between hyperglycemia and albuminuria. The fetal blood has shown a very slightly lower sugar content than the maternal, which difference is somewhat increased immediately after labor. There is every evidence that the transmission from mother to fetus is by the process of diffusion(55).

A small quantity of sugar commonly found in the urine during pregnancy usually disappears after labor. If the glycosuria is not in excess of 0.2–0.3 per cent. on a diet containing 100 grams of carbohydrate, it may be neglected, but if in excess of this amount the women should be treated as any diabetic(28). Mild cases of diabetes untreated during pregnancy may become severe during that or subsequent pregnancies. Cases showing sugar first during pregnancy do better than those exhibiting a diabetes prior to conception. Joslin(29) states that it cannot be accepted that pregnancy aggravates the disease, nor is abortion demanded or nursing contraindicated. He feels that the reason for these patients frequently becoming worse is due to their increased ingestion of food.

ACIDITY.

Acid products in the blood are chiefly carbonic, sulphuric and phosphoric acids which combine with the alkali constituents of the blood and protoplasm. All the reserve alkalies of the blood take the form of bicarbonate, and the alkali utilized is combined with the acids other than carbonic. Therefore, by a determination of the CO_2 present in the blood stream, the reserve alkalinity may be estimated(30). The normal alkalinity corresponds to an aqueous solution containing 0.2–0.3 per cent. of sodium carbonate.

Acidosis—that is, the production of an abnormal amount of acid within the body, is known to occur in various conditions, even though the H-ion concentration of the blood may be normal. It has been shown(31) that here the reserve alkalinity is decreased, that is, the blood's ability to neutralize added acid is decreased.

The H-ion concentration of the blood during pregnancy has been found the same as in the nongravid state and in males(32). There is, during pregnancy, a slight increase in acid production which is compensated by the increase in ammonia produced, and especially by the decreased CO_2 tension of the blood, resulting from the increased elimination of carbonic acid gas through the lungs.

Normal plasma binds 65 c.c. of CO_2 per 100 c.c. of plasma, with 55 and 75 c.c. as the lower and upper normal limits(33). Plasma of pregnant women show figures lower than the nonpregnant average, and at times below the normal minimum. We are justified then in concluding that there exists a slight acidosis even in normal pregnancy(30). The acidity of maternal and fetal blood is practically the same. In both eclampsia and toxic vomiting the alkaline reserve is found about normal for pregnancy, and in no case approaching 30 c.c. of CO_2 per 100 c.c. of plasma, which figure has been found in diabetes and nephritis and which low point must be reached before distress results from the acidosis.

These findings disprove the hypothesis of Zweifel(34) that the fetus eliminates an excess of acid, sarcolactic, which causes a maternal acidosis giving rise to the symptoms of toxemia.

The blood of nephritics showing an increased acidity and that of true eclamptics being about normal for pregnancy, which is slightly below normal, would appear to be a means of aiding in the differential diagnosis of these two conditions with such similar clinical signs.

VOLUME.

For over a hundred years it has been thought that the blood volume was increased in pregnancy. Kiwisch and Scanzoni(35) claimed an increase in total volume with a relative increase in water content.

By injecting a red dyestuff, vital red, into the blood stream and determining the same in the serum and plasma by colorimetric reading it is found that the blood volume is 85 c.c. per kilo, or about one-twelfth of the body weight(36). The normal plasma content of 50 c.c. per kilo of body weight(37) is found increased to 58.4 c.c. just before labor and reduced to 49.3 c.c. after labor(38). Therefore the assumption that there is an absolute as well as relative increase in the plasma volume late in pregnancy seems justified.

The normal blood volume determined by Haldane and Smith(37) is 8.8 per cent. of body weight. Zuntz(39), by the carbon monoxid method found it to be 8.39 per cent. late in pregnancy and more recently, by more exact methods, Miller, Keith and Ronntree(38) found the volume to be 9.56 per cent. of body weight before and 9.05 per cent. after labor.

Heidenhain(40) in 1857 stated the water content of the blood was increased 8–10 parts per 1000 in late pregnancy. With what has already been said, it is evident that the slight increase in hemoglobin, cells, and water content, cannot alone explain the increase in blood volume. We must conclude therefore, that the increase is both relative and absolute. This increase in blood volume would appear to be a physiological provision of nature to cope with the hemorrhagic emergencies of labor.

The fetal blood is more concentrated than maternal, with a specific gravity of 1.060–1.080, as compared with 1.041–1.067. It has a higher hemoglobin content with an increased percentage of salts. The volume is estimated at 250–350 grams depending on weight of the child, and averages about one-eleventh of its body weight(41). Howell gives the volume as 5.26 per cent. Chury and Langrock(42) state the fetal blood equals one-twentieth of the body weight, or 5⅗ ounces for a child of 7 pounds. They call attention to the fact that if one-third of the blood volume be lost, the child is in very serious danger.

BLOOD PRESSURE.

The blood pressure during pregnancy has recently been recognized as being most important. The normal pressure during pregnancy varies between 100–130 mm. of mercury and averages 120. It is known, that particularly in the latter months, there may be a slight rise in the pressure of the individual which does not exceed 10 mm. In the absence of complications Newell(43) found no variation from the average with age, nationality, or multiparity. Irving(44) found higher pressures in elderly gravidæ but thought it was due to their increased age, and to be of less importance than when found in young women.

A rising pressure is more significant of impending trouble than is a high pressure remaining constant. Any pressure over 130 should be under constant observation. Toxemia occurs once in every 500 unselected cases; once in every thirty-two cases with a blood pressure 130–140; once in every eleven cases with a pressure 140–150; once in every three cases with a pressure 150–160; in every other case when the pressure is 160–180 and in every case where the blood pressure exceeds 180.

Albuminuria is a more common finding than is an elevated blood pressure, though the latter is of considerably more prognostic importance. An elevated blood pressure more often precedes than follows albuminuria as a sign of impending trouble, and the degree of elevation is of more importance than the percentage of albumin(45).

The bood pressure should be taken at frequent intervals and any rise above the normal carefully watched. If any material or progressive increase occurs the patient should have hospital care for toxemia, irrespective of the urinary findings which may develop acutely.

The blood pressure of children of toxic mothers does not vary materially from the normal of 75–100 mm.

HEMORRHAGE AND COAGULATION.

Under this heading I will limit the discussion to conditions attributable to changes in the blood and its clotting powers.

There still exists much uncertainty as to the mechanism of coagulation. Howell(46) teaches that prothrombin is acted upon by thrombokinase, derived from the platelets, and converted into thrombin which reacts with fibrinogen to form fibrin of the clot. A substance antithrombin prevents the activation of prothrombin and the formation of thrombin and thereby increases the coagulation time dependent upon the amount of antithrombin present. The blood platelets are greatly increased in numbers at the time of labor. From them, therefore, is obtainable an excess of thrombokinase which hastens the coagulation time(47). Here again is a protective mechanism against undue hemorrhage during labor.

Fibrin and fibrinogen are both increased after the sixth month and at term they may be one-third greater than normal. This fact may partially account for the frequency of thromboses and emboli during the puerperium.

True hemophilia is seen only in males and is inherited only through the female. However, females may exhibit a so-called hemophilic diathesis. When, as is rarely the case, such a condition complicates pregnancy the results may be grave(48).

In both purpura hemorrhagica and hemophilia the platelets are abnormal. In the former they are greatly diminished, and when below 60,000 per cmm. purpura is almost certain to occur. When complicating pregnancy such a condition usually occurs when infection is present. In hemophilia there seems to be an inherited defect in the platelets which may be normal or even increased in numbers, but they are slow to yield their coagulative properties. Coagulation is slow to start and long in completion, but finally a firm clot will be formed(47). The coagulation time of the plasma in hemophilia may at times become normal without the occurrence of bleeding or other demonstrable change in the patient.

Puncture Test.—In hemophilia a hemorrhagic area rarely results from a skin puncture; in purpura it is the rule.

Capillary Resistance Test.—Application of a tourniquet to the upper arm in purpura results in petechial hemorrhages on the forearm; in hemophilia the result is negative(49).

Hemorrhagic diathesis in the new-born has recently received considerable attention. Such a condition is more common than generally realized, but is frequently overlooked as the bleeding is either slight or obscured. Bleeding is most common from the mucous membranes especially the gastrointestinal, although no part of the body is exempt. Intracranial hemorrhage occurs after instrumental or spontaneous labors as the result of pressure; due to defects of the vessels; or to abnormalities of the blood itself. During labor, after rupture of the membranes the point of least peripheral resistance is over the presenting part. Here the local increase in venous pressure may be sufficient to rupture the delicate cerebral or superficial veins and cause ecchymosis. Paul found 20 per cent. of spontaneously born children had retinal hemorrhages and the percentage increased to 50 when they were born through a contracted pelvis.

In hemorrhagic disease of the new-born cerebral hemorrhage may occur alone, or, as is more often the case, associated with bleeding elsewhere. Treatment of such bleeding demands careful observation, differentiation and discrimination. Many cases are transient and will recover spontaneously. If the bleeding is severe or progressive immediate action should be taken.

The normal coagulation time for young children, 75–100 seconds, is considerably shorter than normal for adults(50). Determination of such time should be done on all cases as it would be fallacy to decompress for cranial hemorrhage when the blood was unable to clot properly. The coagulation time being normal, intracranial hemorrhage producing progressive symptoms had best be combated by early decompression. For detailed symptoms and localization I cannot do better than refer you to the very excellent work of Sloan(51).

When the bleeding is due to abnormality of the clotting power the treatment par excellence is transfusion. It apparently makes little difference in the excellent results whether serum, plasma or whole blood is used, and the method of introduction into the child's body can be left to the experience and custom of the operator.

No agglutination or hemolysis has been noted between fetal and maternal blood so that mothers may always be used as donors, her physical condition permitting(42). Such practice is contraindicated only after severe maternal hemorrhage or in the presence of infection. If the mother is not available the father should be used, the next preference being the nearest blood relative. Excepting with the mother or father agglutination and hemolysis tests should be done before transfusion and every precaution should be used to avoid a syphilitic donor though there is not usually time for a Wassermann.

The simplest method perhaps is the drawing, with aseptic precaution, of 300–500 c.c. of blood from the donor, placing it in an ice box and allowing the serum to separate. As soon as available, inject 15–20 c.c. of the serum under the child's skin using several areas for this amount, and repeat every eight to twelve hours as long as bleeding continues. If direct or indirect transfusion be done, the results will be more rapid. Care should be used not to introduce more than 60–75 c.c. into the child's vascular system for fear of overdistention with serious consequences.

SYPHILIS.

This disease should unquestionably be considered in any review of the condition of the blood during pregnancy, as it is through this medium that the spirochetes become disseminated throughout the maternal organism from the initial lesion and are transmitted to the fetus by way of the placenta.

The frequency of syphilis in the pregnant state has been studied by numerous observers. Williams(56) found fetal and placental evidence of the disease in 3.5 per cent. of 10,000 consecutive cases, Judd(57) in 7.9 per cent., Peterson(58) in 4.7 per cent. The latter two observers confirmed their diagnoses by serological examination. Commiskee(59) found 8.0 per cent. of his pregnant women infected only 18 per cent. of whom gave any suggestive history.

When the disease is acquired at the time of conception the primary lesion is frequently not visible, as is also the case in many female infections, the explanation being that the spirochetes enter the tissues of the genital canal, especially the uterine cavity, where they produce but slight if any local reaction. During pregnancy, as noted by Williams(48) and Nonne(60), the secondary lesions are often scarcely noticeable although they may be marked and persistent

When lues is acquired at the time of impregnation the pregnancy almost always terminates by abortion or premature labor. The disease is the cause of 26 per cent. of the deaths of children dying within the first ten days of life; of 40 per cent. of prematures that perish, and of 80 per cent. of macerated stillbirths(56).

Paternal infection of the fetus without maternal infection is generally conceded by most observers not to occur. The wife of the syphilitic who acquired his infection shortly before, or after marriage, is almost always infected, though usually without recognition. Haskell(61) found the wives of 50 per cent of paretics to be suffering with unrecognized latent lues.

The woman who bears a syphilitic child is herself syphilitic for she will infect a healthy child by nursing it; will subsequently bear syphilitic children engendered by a healthy male; will, years later, develop conditions pathognomonic of lues, and by proper staining methods spirochetes can be demonstrated in her body tissues, especially the heart and great blood-vessels.

The behavior of the Wassermann reaction is variable. Some women showing a strongly positive reaction before pregnancy, exhibit a progressively weaker reaction until about the time of labor when their reaction may be negative, only to become positive and progressively so after labor, until it is again strongly positive. Women bearing syphilitic children give 75–100 per cent. positive reactions(62), (63).

New-born syphilitic children very often give negative Wassermann reactions, and fetal blood contains less compliment than maternal (64)(65).

Judd(57) found 5 per cent. of new-born children showing no evidence of the disease gave positive reactions. Peterson(58) found only 16 per cent. of children of syphilitic mothers gave a positive reaction at birth, though about 10 per cent. more become positive after fourteen weeks. In no case when the maternal blood was negative did the child have a positive reaction.

Syphilitic children will infect healthy wet-nurses, and the reverse condition being equally true makes wet-nursing a subject for rigid precaution.

Anesthetics in some unknown way affect the results of the Wassermann reaction, blood for which should be taken from the mother before anesthesia is begun, and from the child not before the tenth day.

The placenta of a syphilitic presents definite macroscopic and microscopic changes(66). Proper staining methods show it to contain spirochetes which are also found in the fetal tissues especially the lungs, liver, heart and great blood-vessels.

The whole subject of syphilis may be summed up as follows: The active syphilitic man usually infects his mate, who as a rule shows little or no evidence of the disease. The usual superficial infection may take place, or, the spirochetes in the semen may enter the maternal blood stream through the walls of the genital canal and become disseminated throughout the body. By way of the blood stream the spirochetes are conveyed to the placenta through which they enter the fetal circulation, giving rise in placenta and fetus to definite lesions which so often result in the premature expulsion, dead or alive, of the child, or to its death shortly after birth.

Osborn Building.

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THE AVERAGE BIRTH-WEIGHT IN 2000 CONFINEMENTS IN THE STATE OF MAINE.

BY

STANLEY P. WARREN, M. D.,

Portland, Me.

The paper of Dr. Brodhead in the June number of this Journal, "Report of a Very Large Fetus," will doubtless start a flood of reminiscence from those of us who have had trials with these big babies. Not the two-year-olds who embellish the pages of the illustrated monthlies, but the *two-hour*-olds, whose is the epitaph,

> "Since I so very soon was done for,
> I wonder what I was begun for."

Every neighborhood has its tales of similar prodigies, 20-pound boys or girls, but the gauge of weight is probably fond admiration rather than the scales. There is a legend in this State of a 25-pound boy born of a Nova Scotia giantess; I should like to have seen it. Almost every one in active obstetrical practice has, at some time or other, delivered one of these wonders, and remembers it not alone for its actual size, but also for the muscle used to extract it. Unless it is actually weighed, however, "looks are deceivin'."

The present paper is based upon my "Register of Confinements," which begins with my first delivery in 1874 and is continuous up to to-day. No doubt there have been occasional omissions during these years, but as a whole it is fairly complete. There is no book in my library I prize more highly, not merely for its story of personal work or as a family history, but specially as it shows the growth of Obstetrics from preantiseptic days to the modern surgical era.

The simplicity of the 'Register' has kept it alive. It has taken only a few minutes of leisure time to jot down the items of each labor, while those of special interest have been written up in detail in the ordinary case-book. Each case is entered under its serial number, then the date, and the mother's name and nationality. Then follows the number of the birth (first, fourth, etc.), the position, sex, weight, length of labor, method of delivery (forceps, version, Cesarean section, etc.), and finally short memoranda like "hard pull," stillborn," "bad tear," etc. The weight has been taken with the ordinary obstetric scales, generally by myself. If for any reason the weight has been guessed rather than measured, the figure set down is followed by a question mark. If the infant has been dressed before weighing, a quarter of a pound is allowed for the clothing. While it is not claimed that this method of weighing gives absolute weight, yet it is satisfactory enough for the purpose.

All but about fifty of the confinements registered have been in this State and over 90 per cent. in private practice, while the mothers themselves have belonged to every grade of life, both rich and poor. The serial number of cases is now over 2000. Some years ago I made a comparison between the classical birth-weight, 7 pounds for girls and 7½ pounds for boys, and the actual birth-weight as I had found it. It was a surprise to find that in my first 500 cases girls averaged 8¼ pounds and boys 8¾. The same average was present in the second 500, and also in the third. Of course, 1500 or 2000 cases are small numbers for statistical purposes, and besides, in the present case are biased by the conditions of private practice and the personal equation. Still, facts are stubborn things.

If the average weight of the mature fetus is, according to authorities (Ballantyne, Edgar, Hirst, De Lee, etc.), 7 or 7½ pounds, then the larger averages of my 'Register' might suggest to the captious critic either that my scales are wrong, or the clientèle has been exceptional. A single scales might be defective, but hardly all of them during forty years. The class of patients is exceptional, but only so far as it is made so by locality.

I am sure, from personal experience and that of brother obstetricians, that babies weighing at birth 10 or 12 pounds are quite frequent in this State. A good proportion of my own cases have weighed 9 pounds, and those of 10, 11, and 12 pounds are not unusual. My three largest babies weighed a few ounces less than 16 pounds. In contrast with these my smallest baby, which lived more than a day, weighed 1¾ pounds. The mother was at the eighth month, very toxemic, and labor was induced. The child's life was saved by constant care, and it has grown into a strong, healthy girl.

In 600 confinements, taken from my 'Register' by even hundreds, the birth-weight of 488 babies is recorded. Two hundred and sixteen of the mothers were native Americans and 272 were foreign born. The average birth-weight of the children of native Americans was 8.3 pounds, and of foreign-born mothers was 8.7 pounds. The gross average was 8⁴⁄₁₀ pounds. Of these 468 babies, 101 weighed at birth 9 pounds (excess fractions omitted), 63 weighed 10 pounds, 23 weighed 11 pounds, and 1 each weighed 12, 13 and 14 pounds. Forty per cent. of these 468 babies weighed within an hour after birth 9 pounds and over.

And now comes the inevitable question, what is the explanation for such large babies in this State? Conceding the fact, is it due to heredity, climate, manners and customs, or is it another of the conundrums of embryology? Balantyne says, "The factors of fetal nutrition are so numerous, and their relations are so intricate, that it is impossible to arrive at the coefficient of nutrition, so to speak." (*Antenatal Pathology.*) It is a general fact, as De Lee says, that "large muscular women have large babies, and the same is true, to an extent, of the father" (*Obstetrics*), but there are striking exceptions. If size alone, or chiefly, of the parents controls the growth of the fetus, then it would be easy to account for the extra-sized babies here, for the State abounds in big men and women as is noticeable during any walk in our streets. It was a common remark during the Civil War that the largest soldiers were found in the regiments from the States of Maine and Wisconsin. A reporter of a daily paper, after visiting recently one of the new concentration camps in a neighboring State, wrote, "They are a fine, spirited, happy and well-disciplined command, but they are not as large in stature as the Maine men, nor do they look so robust." Several of the States in the middle West were settled largely by people from New England, and it would be an interesting study to compare the birth-weight of their descendants with that here in Maine to-day.

This theory, that our higher birth-weight is due to natural causes peculiar to this State, may be reasonable enough for babies of native parents, but fails to account for the even higher birth-weight of those of foreign parents. The Irish are not often of large stature, and certainly people from the South of Europe, Italians for instance, are undersized when compared with the Saxon race. Most of the Hebrews in this vicinity come from Western and Southern Russia, and are rarely of more than medium size. It cannot be that birthplace alone is the reason for our big babies, and, in fact, of my three 16 pounders, two of the mothers were native Irish, and the other was a Russian Jewess. The puzzle still awaits an answer, and doubtless more than one explanation is possible.

A few moving pictures of some of the cases which prompted this paper may recall to my brothers of the obstetrical forceps their own sleepless nights and many backaches, the price of the relentless toil of midwifery.

Mrs. S., an ordinary sized Irish woman, at term with her fifth child, and in active labor for hours before the family physician was called. He failed to extract with forceps, nor could two of us consultants do so either by forceps or version. She died undelivered, and eighteen hours after I delivered, by a postmortem Cesarean, a boy weighing 15 pounds and 13 ounces.

An Irish woman, weighing over 200 pounds, was at term with her third child. An ignorant midwife had failed to "born" the baby, and after trying eighteen hours, I was called. There were feeble contractions and a large child impacted at the brim, in third cephalic position. After a long, hard struggle a stillborn girl was extracted, with the cord around the neck and arm and a badly fractured skull. I have always felt, that a larger forceps might have delivered it alive. I weighed the baby the next day, when the pillow upon which lay the head, was soaked with blood. Even with this loss it weighed, naked, 15 pounds and 14 ounces.

A stout Jewess was at term with her fifth child. She did not call me until well into labor, explaining the delay by saying she always had her children quickly and easily, and did not wish to detain me. There were strong pains, with the head well engaged in the fourth position. There being no progress, after an hour the Tarnier was applied, but failed to deliver. A difficult Scanzoni was done and the head extracted after an hour's pulling by two of us, but it took another hour to deliver the body. The child was a male, stillborn of course, and weighed, naked, 15 pounds and 13 ounces.

A rather stout American had been in labor with her fifth child twenty-four hours, with little if any progress, though her other confinements had been easy and natural. The head rotated in the forceps from the fourth position, and a live boy was extracted that weighed 13 pounds and 5 ounces.

I attended a large Irish woman in her eighth, ninth, and tenth confinements. The children all lived and weighed, respectively, 13, 12¼ and 13 pounds.

A young, well-developed American was at term with her first child. After several hours of labor the head was readily delivered from the first position, but it was a hard pull to extract the body. The lusty boy weighed 13½ pounds.

The experience of Mrs. M. in confinement will serve to demonstrate, as well as another, my proposition, that we have big babies in this State. She is a slender, hard working housewife, of Nova Scotia descent, who is never ill except when in childbed, and whose first intimation of pregnancy is the motion of the child. Her true conjugate measures 3½ inches, and I have always managed to deliver her somehow *per vaginam*, though twice I have prepared her for a Cesarean. The history of her labors is briefly as follows:

1903. First, was three weeks beyond term, O.L.A., very hard forceps delivery, female living, 9.75 pounds.

1905. Second, at term, O.L.A., easier forceps than first, female living, 11.5 pounds.

1907. Third, at term, O.D.P., forceps failed, podalic version, cord prolapsed, male stillborn, 11.5 pounds.

1908. Fourth, at term, O.L.A., spontaneous birth, female living, 8.75 pounds.
1910. Fifth, at term, O.L.P., forceps and Scanzoni, male living, 10.25 pounds.
1911. Sixth, at term, O.L.A., spontaneous birth, female living, 9 pounds.
1912. Seventh, at term, O.L.A., forceps and Scanzoni, male living, 9 pounds.
1914. Eighth, at term, O.L.P., forceps and Scanzoni, male stillborn, 11.25 pounds.

I anticipate the question of my readers, granting the truth of your record is it simply one of the chances of practice, or a general fact in the vital statistics of your State, that its birth-weight averages a pound or a pound and a half more than the normal? The answer depends largely, I think, upon the fidelity with which others among our obstetricians have kept a similar record to my own. I am hoping this paper may lead them to publish their experience in this matter.

159 High Street.

GALL-BLADDER TROUBLE COMPLICATING DISEASE OF THE INTERNAL GENITALIA.*

BY

J. H. CARSTENS, M. D.,

Professor of Abdominal and Pelvic Surgery, Detroit College of Medicine and Surgery,
Detroit, Michigan.

When in the process of evolution, some thirty years ago, the gynecologist of the past developed into the pelvic surgeon, it was soon found that the great difficulty in this new field was to make a correct diagnosis, and it was noted that as our experience increased we had to deal with many complications. Since then the removal of ovarian tumors and the plastic operations have been simplified. The diagnosis, as a rule, was generally correct, so that now there are few conditions which can be mistaken for an ovarian tumor. When it comes to the inflammatory and septic conditions especially, there are so many complications that mistakes in diagnosis are often made. Sometimes the diagnosis is correct, and the disease is present just as diagnosticated, but something else is found which was not suspected. Often the diagnosis between right-sided pus-tubes and appendicitis is not easy, for sometimes both exist at the same time. Often an extraperitoneal abscess is taken for a pus-tube, with disastrous results, as a rule. Sometimes no pelvic trouble exists, but there is trouble in the intestines, as a diverticulum, or adhesions causing partial obstruction may be found, instead of ovarian or tubal disease. These conditions are sometimes present without pelvic disease, while, at other times, pelvic diseases exist, as well as the conditions enumerated. Hence the pelvic surgeon soon found that he was not able to limit his practice to pelvic surgery; that if he wanted to cure his patients, he had to do all kinds of abdominal operations. Thus, as our diagnostic skill has increased, and our operative technic has improved, we no longer limit our practice to the surgery of the female pelvic organs, but we have created and developed and made what to-day we call, "abdominal surgery," and now,

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September, 17–19, 1917.

"No pent-up Utica confines our powers,
The whole extent of the abdomen is ours."

We have not only settled the moot questions involved in diseased conditions of the pelvic organs, but have cleared up the diagnosis of appendiceal complications which were, at first, apparently so difficult. Then we began to deal with the complications observed in pelvic diseases when associated with trouble in the upper abdomen. We were soon able to show that jaundice, as a symptom, was but seldom found in gall-stone or gall-bladder diseases. There were plenty of symptoms which made it comparatively easy to establish a diagnosis of the disease of the gall-bladder. We were also obliged to invade the field of the gastroenterologist, because we were able, when the abdomen was opened for pelvic troubles, to explore the stomach, pylorus, and intestines, and to find abnormal conditions that had not been suspected by the practitioner of internal medicine.

With the aid of the wonderful discovery of Röntgen, the *x*-ray, we can now diagnosticate many of the more obscure stomach and intestinal disturbances. To-day every pelvic surgeon must be an all-around abdominal surgeon; in fact, no one has a right to do pelvic surgery unless he is also a master in abdominal surgery, and has thoroughly investigated the patient's condition from every standpoint to determine if there exist any other abdominal troubles; and is prepared to operate on them, if advisable, at the same time. We can all do multiple operations on a patient at one time; we can also jeopardize the patient's life by trying to do too much in one operation. Still we should not subject a patient to two operations if they can be done under one anesthetic. This may frequently be done *if we are prepared to do it;* if we are not, it is difficult for us, and hazardous to the patient to perform an additional operation, not contemplated from the start. The point I wish to emphasize is that a correct diagnosis of all the troubles should be made, if possible, and then we should be prepared to relieve them during one operation.

It has become quite common, when operating upon the tubes, the ovaries, or the ligaments, to remove the appendix at the same time, but when we operate for gall-bladder disease, or ulcer of the stomach or of the duodenum, the removal of the appendix is not very frequent, as far as I know. Much depends upon the safety of the pelvic operation. If we perform some vaginal operation, a curettage, or a trachelorrhaphy, or both, or if we operate for piles and a lacerated perineum, and then proceed to operate for pelvic adhesions, or shorten the ligaments, or remove the tube, the patient is not, as a rule, in a condition to stand another operation in the upper abdomen, especially if the operator is slow, and his operating facilities are not very good. At the same time, I am an advocate of doing pelvic- and gall-bladder operations at one time, if the patient's life is not jeopardized thereby. The danger is greatly reduced if we make a correct diagnosis before the operation, have everything prepared for any emergency, and are reasonably quick in our work. Naturally, a great deal depends also upon our assistants, the anesthetists, the nurses, and everything else that goes to make up rapid team work.

What I plead for is, that in all cases of pelvic trouble, be they ever so simple, and uncomplicated, like laceration of the cervix and perineum, or displacement of the uterus, we should put them entirely aside, and thoroughly investigate the patient's general condition as though she had no pelvic disturbance at all. Get a correct history of the case; try to make out whether the patient has, perhaps, some trouble with the appendix, a loose kidney, disease of the gall-bladder, gastric or duodenal ulcers—in fact, any abdominal trouble; and, if you have clear evidence, you can do an abdominal operation with the patient's consent, even if she thought she required only an unimportant vaginal operation. However, in all such cases that require an abdominal section for the purpose of operating upon the tubes, the ovaries, the ligaments, or the uterus, we should make an incision large enough to explore the whole abdominal cavity. With our modern and aseptic technic, we need not limit ourselves to as small an incision as possible, as we formerly did to prevent postoperative hernias. We can now afford to make a free incision in all cases where we suspect any other abdominal diseases. With the gloved hand thoroughly cleansed and dipped in saline solution, we can explore the whole abdomen, and thus make it possible for us to learn the exact state of all the abdominal viscera. In this connection let me say that in all these cases it is best to have the consent of the patients, and have them understand that we should be allowed to do anything that we think is for their best interest, thus preventing repeated operations which might otherwise become necessary.

How many patients are we called upon to operate on, who have been subjected to several operations before, simply because the previous operator was a poor diagnostician, and recognized only the one pathologic condition, and operated for that?

There is a limit to a patient's ability to stand numerous operations, and we certainly must work safely. Sometimes it is better to perform two or three operations at different times, but this should rarely be done.

We frequently find gall-stones associated with pelvic trouble, especially fibroid tumors, pelvic adhesions, and uterine displacements. It is claimed that in women gall-stones are five times more frequent than in men. If we inquire carefully into the history of these women, we shall find that they often have had puerperal fever, septic conditions following labor, or miscarriages, and that they were confined to bed for from four to six weeks. Even though the patient complained of no symptoms, we can, usually, by palpation, detect gall-bladder disease, and be prepared to relieve it when operating for the other complications.

To sum up, I would say: (1) Many women with pelvic trouble also have disease of the gall-bladder and other organs in the upper abdomen. (2) No patient, with even simple pelvic disease, should be operated upon unless a thorough examination has been made of all the abdominal organs. (3) In cases of doubt, the incision should be large enough so that the whole abdomen can be explored. (4) In all pelvic operations, where gall-bladder disease exists, the latter should be operated at the same time; provided that the patient's life is not endangered by prolonging the operation.

1447 David Whitney Building.

GALL-BLADDER SURGERY.*

BY

JOSEPH H. BRANHAM, M. D.,

Baltimore, Md.

Surgical interference in gall-bladder conditions is nearly always necessitated by cholecystitis and cholelithiasis. Traumatic conditions and tumors, while they may necessitate operations, occur so rarely as to be of little importance.

The walls of the gall-bladder consist of the same material that is found in other hollow organs; the muscular coat is associated with some elastic tissue and is usually very thin. Only a very small percentage of the bile secreted can be contained in the gall-bladder and, therefore, the function of the gall-bladder as a reservoir is of slight importance. That the gall-bladder relieves tension, when the duodenum is distended with gas or fluid, seems to be of some importance, since the common duct passes through the wall of the duodenum in an oblique direction, so that there is present a perfect valve mechanism which renders regurgitation impossible. When there is great distention of this part of the intestinal tract, the flow of the bile is necessarily arrested and at such time an elastic reservoir, such as we have in the gall-bladder, may greatly relieve the tension in the bile-ducts. That this is the case, is evidenced by a decided dilatation of the ducts after the removal of the gall-bladder.

Many animals have no gall-bladder at all, but instead have rather large and distended ducts; in other animals the gall-bladder is many times larger in proportion than in man, and in these the storage function is of great importance. When it comes to surgical interference in a very large number of cases of gall-bladder disease, the gall-bladder has already ceased to functionate, either because it is filled with a thick, tenacious mucus mixed with bile or stones, or, because of inflammatory changes in its walls which have destroyed the muscles and left a thick, nonelastic, fibrous organ which is entirely useless.

Etiology.—One of the facts which seems definitely to have been established concerning gall-stone disease is that gall-stones are caused by infection of the gall-bladder; cholecystitis is a primary disease, gall-stones a secondary; these, in turn, however, may increase the inflammatory conditions. In a very large proportion of gall-stone cases pathogenic bacteria can be demonstrated in the bile, in the walls of the gall-bladder and even in the gall-stones themselves, often forming a nucleus for the stones. The route by which the infection reaches the gall-bladder seems to vary. Careful investigation indicates that it is most often by the blood current. Contrary to the opinion formerly accepted, streptococci are the most common form of infective organisms, colon bacilli, and the bacilli of typhoid fever are frequently found and, in many cases, mixed infection is present. The bacteria found in the gall-bladder during cholecystitis, or in the gall-stones, have an especial affinity for the gall-bladder and ducts when injected into the blood current of animals.

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* Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

The infectious nature of cholecystitis and gall-stone disease being accepted, the predisposing causes become of great interest. The patient nearly always has some acute infectious disease, such as typhoid fever, pelvic abscess, or tonsillitis, from which the infection may have arisen. Women, especially those who have had children, are more subject to this disease than men. It is also a disease of middle and advanced life, being very uncommon before twenty. People who live a sedentary life, and those who are overfed and overfat, are often affected. It has frequently been observed that infectious bacteria, when introduced into the gall-bladders of animals, disappear without causing symptoms but, if the duct is closed, infectious processes always develop.

These observations demonstrate, beyond a reasonable doubt, that stasis is a very important element in the production of this condition. The lax condition of the abdominal walls, and the general want of muscular tone in the classes of people subject to this disease, predispose to incomplete emptying of the gall-bladder.

The fact that women, especially in Europe and America, have been its most frequent victims, would indicate that the wearing of ill-fitting and improper corsets is probably a cause of this partial stasis. Japanese women, who do not wear corsets, and who are almost always strong and active, are no more prone to this disease than men. In Japan, in 8406 necropsies, Miyake found gall-stones in 3.05 per cent., less than half as often as in Europe and America. The sexes were about evenly affected.

Stasis, which has long been recognized as an important element in the causation of appendicitis, is, in my opinion, still more important in the production of cholecystitis.

Treatment.—The medical treatment of gall-bladder disease is, I think, of great importance. Although we know that the removal of the gall-bladder is not followed by very serious conditions, and that drainage is not a dangerous procedure, yet our studies indicate that the gall-bladder has certain functions, and drainage always causes a certain amount of damage to this organ. The adhesions which follow an operation are a source of pain and inconvenience, and, therefore, operative procedure should not be resorted to until proper medical and hygienic treatment have proved ineffectual. Such treatment generally consists of proper diet, remedies to stimulate the free flow of bile and more especially such a course of exercise as will restore the tone of the abdominal muscles, and, if possible, the normal contour of the abdomen.

The surgical treatment of gall-bladder disease is of recent development. The relative advisability of cholecystostomy and cholecystectomy has been discussed *pro* and *con* by hundreds of surgeons. In the *Medical Record*, May 16, 1903, Woods Hutchinson strongly advised cholecystectomy for gall-bladder diseases. Bland Sutton, in 1907, agrees with this opinion. Mayo Robson, shortly afterward, urged the advantages of cholecystostomy. In 1913, before this Society I strongly advocated the advantages of the removal of the gall-bladder and predicted that this would be more and more the operation of choice. This prediction of mine has been completely fulfilled.

The advantages of cholecystectomy are: (1) The number of permanent cures effected by it are greatly in excess of those effected by cholecystostomy; (2) secondary operations are very rarely needed; (3) malignant conditions, only to be detected by microscopic examinations, are not infrequently found upon removal of the gall-bladder, and thus the danger of malignant development is prevented. Cholecystectomy is also better where there are marked diseased conditions, such as irregularities of the mucosa, presence of gall-stones, fibrous thickening of the gall-bladder or stricture of the cystic duct, and because it does not leave *in situ* a diseased organ to cause future damage. But its greatest advantage is that it does away with the adhesions which always follow drainage, and are a source of discomfort and danger. However, in cases where the gall-bladder is comparatively normal, and where the walls are not markedly diseased, cholecystostomy gives excellent results and should be resorted to. But, in my opinion, many cases in which the gall-bladder is not sufficiently diseased to justify removal could be cured by proper medical treatment, and where the gall-bladder is diseased to such an extent as to require operation, cholecystectomy will give the best result in most cases.

The operative mortality following cholecystectomy is probably not greater than that following cholecystostomy, even when we take into account that cholecystectomy is the operation of choice in severe cases.

The last reports from the Mayo Clinics indicate that cholecystostomy is much more dangerous. This can be readily explained. In cholecystostomy there is left a diseased and often infected organ—a source of possible secondary trouble. If everybody removes an infected appendix, why not remove an infected gall-bladder?

Operation.—In removing the gall-bladder, the subperitoneal dissection is of importance, so that we leave plenty of serous tissue to cover over the denuded surface. Unless the condition is one of acute infection, the cystic duct should either be severed by cautery, or carefully disinfected, and the wound closed without drainage. A careful inspection of the ducts should be made in order to make sure that there is no obstruction. Where there is a condition that renders obstruction to the common-duct probable, drainage is the operation of choice.

The argument that in cholecystostomy we have an easier route for drainage is to be considered, but it is counterbalanced by the greatly lessened chance of future disease after extirpation.

THE LEFT FALLOPIAN TUBE AND INTESTINAL STASIS.*

BY

DOUGLAS H. STEWART, M. D.,
New York City.

It may have occurred in the experience of everyone present, that after the performance of a painstaking operation upon a sufferer from some abdominal trouble, that was in no way connected with a woman's genital tract, a pyosalpinx has been produced by a concealed gonorrheal infection. Possibly the tubal trouble appeared after the surgical wounds were completely healed; so that when all seemed to be clear sailing a sudden ileus and its toxemic storm arose from the new pathology. But with such a condition of affairs we have nothing to do, beyond mere mention.

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* Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

This paper is based upon histories of two women whose tubes presented no evidence of being infected or of having been inflamed. One of the women had never married. The other had done so and had borne two children. Both women were well past the menopause. No claim is here made that the condition described is at all rare, only that it has not yet been dignified by being mentioned. Any doctor, who came across such a situation in exploring an abdomen, would consider it a band, and would then sever it in order to free the gut; but he would do so without giving thought as to its nature or its origin.

The condition is easily made out by means of a bimanual examination, with the investigating finger in the rectum, working against the counter pressure of an opposing hand, externally applied. The author's attention was called to the state of affairs in the following manner:

CASE I was a maiden lady well past sixty years of age. According to her story, she had suffered for a very long time from some sort of an abdominal tumor that she could feel perfectly well with her hand. This tumor was not given a name by any of the many doctors who had attended her professionally; but every one of the number had advised a prompt abdominal exploration. Though this sort of thing had been going on for thirty years or more, the exploration had never been performed because the patient herself would not submit to any sort of an operation, nor would she consider the warnings of her advisers when they foretold future and evil results, if the procrastinating process obtained indefinitely. As might have been expected, when she came into the present writer's hands she had reached that mental and physical state of pain intimidation in which an operation was most welcome, because she rather hoped that it would kill her and so end it all.

The patient was both fleshy and distended; she evidently did have an abdominal growth, and palpation gave the idea that the growth was multilobular in character. An examination of the vagina was not refused if it were absolutely necessary; but the information was volunteered that if the womb were touched by a finger, or even if the nozzle of a syringe were to come in contact with it, then the whole abdomen would ache, pain and throb for hours afterward. The sensation was described as a dull, heavy, unbearable and disheartening ache, that nothing would stop until it finally wore itself away. Upon some occasions a hypodermic of morphine had been administered, in which event nausea had made matters rather harder to endure, and there was little, if any, counterbalancing relief. In short, the lady was most anxious to avoid a vaginal examination, and asked if there was not some way of dispensing with it. As is well known, much valuable information may be obtained at times through the rectal route. Therefore, that was employed first, and upon the anterior wall of the rectum was found a hard, rigid cord, or narrow band. Although this did not encircle the bowel, still its mechanical effect was such that the bowel was ballooned both above and below the well-marked ridge that was made in the lumen.

Replies to questions revealed that for an indefinite number of years the patient had been obliged to devote an hour or two daily to washing out the rectum with repeated enemata of soap suds, though at times solutions of table salt or of Epsom salts were employed for the purpose. This injection process was repeated over and over again until the patient thought that the result obtained amounted in solid contents to about an equivalent to a natural movement. The lady and her brother apparently took delight in saying that many physicians had seen the patient, and yet none of them could make a diagnosis. They were informed that they could put me in the same class as the others. The only opinion that could be formed on my part was that there was a partial obstruction by a band that might or might not come under the head of semivolvulus; that there were tumors in the abdomen; that they were neither fecal nor tender; that the pain was caused by pressure upon nervous tissue, and that the exact abdominal condition could only be determined by actual exploration.

Operation was agreed upon and performed by the late Dr. Dawbarn. Before the patient was anesthetized, the band could not be made out by vaginal examination. Under anesthesia it could be felt, though its true nature was not apparent nor the manner of its impinging upon the anterior rectal wall. That is to say, something could be located and might even be described if one knew what it was beforehand. The abdomen was opened and, to quote the doctor, the interior looked like a pawnbroker's window that was hung with gold watches. The condition was due to rather large and multiple lipomata, mesenteric, and pretty much everywhere else in origin and situation. Their number rendered any attempt at removal out of the question. The doctor thought that destruction of the band would remove pressure, and with a free bowel plus an antifat regimen a good result might be expected. This was done, relief followed, and the pathologist thought that the hypertrophy of the Fallopian tube could be fully explained by surplus and unusual nutrition. So far as could be told, the adhesion was due to some cause in the bowel or in the bowel wall, but not in the tube that became attached to the wall and in due time derived an additional blood supply therefrom.

Case II.—The second patient was a woman upon whom I had operated for retroversion and cystic ovary. The result was good and all went well for some eight years, at the end of which time she returned and stated that she was all right so far as any womb trouble was concerned; but that she could not get her bowels to move without prolonged and repeated enemata. Examination by the vaginal route revealed nothing abnormal, but per rectum the picture was almost identical with that of patient, Case I. This woman was very thin and the conditions were readily mapped out. There were no tumors but there was a well-marked enteroptosis with movable kidneys.

The differential diagnosis between the condition described and a normal Houston's valve is easy. The valve is elastic, the band is inelastic. The valve is so evidently within the rectum and the band manifestly outside of it. If a valve were burned or cicatrized, its shape could not be changed by gentle steady finger pressure, and quite possibly the differentiation could not be made, unless by an abdominal exploration.

The lesson drawn from the experience with these patients is that after the menopause because of some infection, or from some inflammation of the bowel or of its peritoneal covering, the Fallopian tube upon the left side may derive an additional blood supply through adhesion may thus take on a new lease of life and not go through the usual process of atrophy. This is not true for the whole tube but for a portion of it only. The thickened adherent tube does not expand or contract but dents the rectal wall so that the bowel is converted from a cylinder into a sort of semi-cylinder. This condition appears to be sufficient to act as a brake upon the fecal flow and to tire out the expulsive powers of the bowels therefore the viscus balloons, as if exhausted, both above and below the partial stricture. Furthermore, the severance of the band relieves all the symptoms, if the raw surfaces are properly covered.

128 West Eighty-sixth Street.

A CASE OF A GIANT COLON.*

BY

THOS. B. NOBLE, M. D.,

Indianapolis, Ind.

Megacolon, or Hirschsprung's disease, is a congenital colonic anomaly, in which one or more parts of the colon are increased in size, both as to diameter of the lumen and the thickness of the wall. The condition may extend throughout the entire length of the colon, thereby increasing its size in its length, as well as all of its diameters. Being congenital, its symptoms begin early in life and, like congenital cystic degeneration of the kidneys, tend to end fatally.

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The symptoms of megacolon are those of obstinate obstipation and constipation with abdominal distention, diffuse general abdominal distress, attacks of vomiting, colicky, cramp-like pains, sometimes movable tumors, and the general symptoms of fecal intoxication.

The case I desire to present is that of a young woman, twenty-seven years of age, whose inheritances are good. From early infancy to twelve years of age, she suffered continuously with constipation. Her parents say that they do not remember of her having a normal, spontaneous bowel movement. At about the age of twelve she had an attack of acute abdominal pain, with distention and vomiting. She had frequent chills and fever. She was given medicine to move her bowels, which failed. After about a week of such illness, one of our local surgeons of national reputation, who has since passed away, was called. He made a diagnosis of some form of abdominal tumor and advised an operation. She was started from her home in a neighboring city to Indianapolis for the purpose of having an operation performed, but on the way her bowels began moving and by the time she reached the hospital, the tumor had disappeared. Her general condition became rapidly better and no operation was performed. Six months after this experience, another attack similar in character occurred, and again by persistent purgatives and colonic lavage, she recovered from her second attack.

These attacks with varying severity have now recurred about every six months during the last seventeen years. Just previous to my seeing her, she had had a severe attack lasting ten days, in which she had abdominal pain, distention, vomiting and obstinate constipation. It was said that a tumor was located in the lower part of abdomen, but that after the passage of a very large, hard fecal mass, the tumor had disappeared.

When I first saw her, her bowels had been moving with liquid stools under the influence of albolene. Her general nutrition was good. She had a muddy complexion, coated tongue, foul breath, and felt generally depressed. The abdomen was distended and doughy. Behind the uterus and seemingly fixed as a part of it, was a hard, globular body which did not pit on pressure, and was not painful. She had for some months a menorrhagia, and the picture was typically that of a uterine fibroid. The tumor lying behind the uterus crowded the uterus upon the bladder and produced frequent dysuria. I felt certain of the presence of a fibroid tumor, believing that it had largely to do in a mechanical way with her recurring attacks of intestinal obstruction.

She was operated eight months ago. A median abdominal incision was made, revealing, instead of a fibroid tumor, a colon enormously enlarged throughout its entire length, in the lower end of which lying just above the rectum and behind the uterus was a large globular fecal mass about the size of a croquet ball. The lateral sacculations throughout the entire colon were absent, but the organ was almost regularly tubular in character and looked very much in color and physical character like a collapsed uterus following a Cesarean section. Its walls had much the color of uterine muscle. I have seen the walls of the uterus when they were no thicker than were the walls of this colon. The feature of enormous hyperplasia was most striking. The general increase in size and thickness of the organ extended from the appendix throughout the length of the colon to within 2 inches of the bottom of Douglas' fossa. From this point downward the caliber of the gut and thickness of its walls seemed perfectly normal. Just what to do with this globus fecalis inside the gut and the colon itself was questionable. The removal of the fecal ball might have given temporary relief, but would not have removed the underlying pathology back of it. Colonectomy was determined upon as the safest and most satisfactory procedure.

The peritoneum was cut around the gut as it passed behind the uterus, and the rectum freed from its attachments between the uterosacral ligaments. Now pulling upward upon the gut, we were able to get enough of intestinal substance out of the pelvis to complete an anastomosis with the head of the colon, which was drawn down to it. The omentum was dissected loose from transverse portion of colon and preserved. It has been denied that the omentum can be preserved in colonectomy. That is not always true, for we were not only able to preserve it in this case, but have done so in a number of others. There were no clamps used in this operation, the technique of anastomosis being completed entirely with needle and thread. There was no shock following this operation, only 3 or 4 drams of blood having been lost. We had no infection in her wound, which extended from the symphysis within 2 inches of the ensiform. A short rubber tube was introduced through the anal sphincters to prevent hypertension upon the suture lines from gaseous distention. The tube was removed on the fifth day. This patient made as good a recovery as if we had done a simple myomectomy.

The patient presented herself recently in my office. Her tongue was clean, her complexion clear. She had gained 20 pounds in weight, her bowels were moving without assistance, twice, sometimes three times a day, and her breath was free from odor.

Apropos of this report, our records during the last four years show a series of twenty-nine cases in which the colon has been removed in whole or part. The conditions demanding this operation have been tuberculosis, carcinoma, and chronic irreparable distortion, with dilatation and stasis, due to pericolonic adhesions.

No class of cases has given us more gratifying results than those obtained in this series of cases.

Though the colon be abundantly supplied with blood and highly potential of infection, both the loss of blood and the accident of infection can be overcome by a simplified technic. Our plan of removal is briefly as follows: A free median incision is made. The omentum is lifted out of the abdomen, dragging the colon with it and held under tension in a fan-shaped spread at right angles to the axes of the body. With a sharp knife the posterior layer of peritoneum of the omental substance is cut free from its attachment to the colon in its entirety, and if the incision be made to hug closely to the muscular coat of the gut there will be no hemorrhage. This frees the omentum from the colon, preserving its blood supply, and leaves the colon attached only to its mesentery. The omentum is now spread out upon the upper abdominal zone and covered with moist gauze. The colon is next lifted up in same position as before, and by looking through the mesentery the blood-vessels are readily observed, doubly ligated, and cut with the intervening mesentery. That portion of the bowel to be removed is now included between two pairs of silk ligatures. The first pair is placed about the bowel just above the ileocecal entrance and the second at the lower end of the sigmoid. By cutting between these two pairs of silk ligatures with a thermocautery, the colon is freed from all its attachments and removed. The cauterized stumps are now inverted by a silk suture, as is the stump of appendix in an ordinary appendectomy. The head of the colon is next united to the lower end of the sigmoid by a lateral anastomosis made with a three-row suture. Obviously, this procedure has now formed a mesenteric foramen underneath the junction of the bowel which should be closed by a running suture of catgut. The omentum is next brought down and the stump of mesentery left by the removal of the colon, is sutured to it along the area from which the colon has been removed. Care should be taken not to wound the blood-vessels in putting in this line of suture. Care should be exercised as well in dealing with adhesions earlier in the operation, which are often found at the splenic flexure, which sometimes hold the colon in close proximity to this viscus. These adhesions should be cut and not torn loose, for, if torn, they may bring away part of the splenic capsule, which leads to very annoying and troublesome hemorrhage. The abdomen is closed in the usual manner.

720 NEWTON CLAYPOOL BUILDING.

TREATMENT OF APPENDICULAR ABSCESS.*

BY

W. A. B. SELLMAN, M. D.,

Baltimore, Md.

We are very uncertain why these abscesses develop. Many of the cases present few or no symptoms until within a few hours previous to the operation. Many of them are performing their usual duties or are engaged in the work pertaining to their vocations before calling upon a physician for the relief of mild abdominal uneasiness, or have had only a slight rise in temperature.

A recent case presented merely slight symptoms attributed to indigestion. At 3.00 P. M. when called in consultation by the family physician, there was no pain elicited upon pressure in the right abdominal region. At 5.00 P. M. a temperature of 104° F. developed. She arrived at the Hospital at 8.00 P. M. When the abdomen was opened at 10.00 P. M. an enormous appendicular abscess was found, opened and thoroughly evacuated. The appendix was swollen and tied down by adhesions. It was not removed. Three cigarette drains were introduced, one within and at the bottom of the abscess sac, one above, and one below the sac. The drains were allowed to remain six to eight days and then withdrawn. The wound was cleansed with dilute peroxide solution until healing took place from the bottom. The patient returned home at the end of three weeks. She has been perfectly well since that time and able to look after her household duties.

The description is typical of many of these cases. Whether a secondary operation will be required for the removal of the appendix is uncertain. We have patients in whom a period of five to eight years has passed since the evacuation of large abscesses and no symptoms have developed which would suggest a secondary operation. These cases did not present a history of traumatism or of acute indigestion. The gall-bladder, nose, throat and teeth were normal. In a word, there were no apparent foci of infection.

A most common complication with appendicitis is the occurrence of circumscribed purulent peritonitis and suppuration in the adjacent retroperitoneal tissue. We frequently have gangrene and perhaps perforation, but not necessarily so.

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We can frequently locate the position of the appendicular abscess by recognizing a swelling over the site of the collection of pus. In these cases we do not adhere to the McBurney point for incision. If, upon opening the abdomen, we find that the purulent fluid is encapsulated, we pack around the abscess with a gauze towel and attempt to draw the sac out as far as it is safe to do without rupture. If the sac is located low down in the pelvis, it is advisable to make a stab-wound and drain from the most dependent portion. A drain is introduced in order to clear the sac of later accumulation of purulent fluid. A gauze towel is packed around the sac and the appendix brought up and removed. Many cases have been operated upon and drains placed high up and later it was required to make a stab-wound lower down to insure drainage of the abscess. Pus, which is allowed to remain, is liable to burrow into the rectum, vagina or bladder. This purulent fluid is liable to infect tissues which, when the operation was performed, were in a healthy condition. The finger should be introduced into the deepest portion of the sac and its limits defined. The cigarette drain is made use of. Iodoform gauze (10 per cent.), wrapped with thin rubber tissue, is the most efficient drainage that we can use. The rubber tissue should be wrapped around the gauze at least twice in order to prevent the purulent fluid infiltrating into the tissues through which it passes. The gauze should be fluffed at the ends and project 1 inch beyond the tissue. The end, which is brought out upon the abdomen, should be caught with a sterile safety pin. The number of drains depends upon the size of the abscess and the condition of the structures around it. Where we have a gangrenous appendix, three drains are usually introduced, one within the sac, one below, and one above.

The technic employed for the removal of the appendix is to seize the end of the organ with hemostatic forceps and to pass a small Cleveland needle under the appendix close to the cecum. A No. 2 catgut ligature is caught by the needle and drawn through, to be later used to tie off the appendix. A heavy hemostat grasps the organ three quarters of an inch from the cecum. The walls of the appendix are crushed half an inch from the cecum by another forceps. The ligature is now tied around the appendix, and the ends cut short. Lifting the distal end of the appendix, a No. 2 catgut suture is introduced into the mesoappendix in a position to catch the first artery. The tissue of the mesoappendix is then cut close to the appendix to a point near second artery. Another stitch is placed around this vessel and the mesoappendix cut again. This is repeated until the cecum is reached. A circular suture of fine silk threaded upon an intestinal needle is placed in the cecum below where the appendix is inserted. This suture is allowed to remain loose. The appendix is now cut through at the point where its walls have been crushed. This may be done with cautery or the knife. If cut through by knife, the raw edge should be touched with carbolic acid and neutralized with alcohol. A small Halstead forceps is placed upon each side of the cecum at the point where we intend to turn in the appendix. The end of the appendix is pressed or inverted into the cecum by pressing gently with small forceps. The circular suture is now tied sufficiently tight to hold the appendix within the bowel. With one end of the circular suture passed into the serous membrane, the inverted appendix is sewed in and the raw surfaces are covered up. This prevents future adhesions taking place. All instruments and sponges are now removed and the wound wiped out with gauze sponges moistened with saline solution. The abdominal wound is closed in the usual manner, or, if conditions require, the drains are inserted. The patient should be placed in bed in the Fowler position and proctoclysis commenced at once. We favor the use of warm soda solution in preference to the saline. Its use is maintained until danger of shock has passed. Rubber tissue, thoroughly dried, should be placed upon the skin to protect it from the moisture oozing out of the drainage tubes; fluff gauze and an abdominal pad adjusted, held in position by a many-tailed bandage, lightly fastened. A tight bandage makes the patient very uncomfortable. Unless discharge appears through the dressings, they are not disturbed in drainage cases until the third day. The fluff gauze is changed, and any pus present expressed from the drains by a pumping motion of the gloved hand. Fresh pads are adjusted and the bandage made comfortably tight. Do not attempt to withdraw the drains until certain that the pus has been evacuated or no more can be accomplished by their presence. After the eighth day, if the purulent fluid continues to flow freely, the lower drain may be removed in order to give free vent for the discharges. Later, according to the judgment of the surgeon, the remaining drains may be removed or replaced and irrigation made use of to clear the wound and sac of any purulent material that may remain. We frequently employ a solution of iodine (one part of the tincture to three parts of alcohol or water). A solution of carbolic acid frequently proves stimulating to the development of healthy granulation.

At times the bowel is so gangrenous that small fecal fistula develop. These frequently close without treatment. If large, it may be required to reopen the abdomen and suture the openings or perhaps perform resection of the intestine.

In conclusion: the important features in the treatment of appendicular abscess are:

First.—To bring the sac up and wall it off so that the purulent fluid may not infect the surrounding tissues; to secure drainage after being emptied at its most dependent portion; to prevent choking and obstruction of these drains.

Second.—Protect the healthy parts by using rubber tissue around drains and upon the skin around the abdominal wound. Change the fluff gauze whenever it has become saturated with the discharges. Do not withdraw drains until satisfied that they have accomplished all that can be secured by their use.

Third.—Stimulate granulation and destroy pyogenic tissues by irrigation. Keep the patient in the most favorable position to secure drainage.

Fourth.—If we find the appendix and intestines showing evidence of gangrene and the patient is threatened with shock, refrain from removing the appendix, as many of these cases recover, whereas if the operation is prolonged, they die. In the majority of cases no postoperative symptoms develop. We have patients who have been operated upon five to eight years ago without their developing any indication for a secondary operation. Experienced surgeons have claimed that 10 per cent. require a secondary operation. Our experience does not coincide with these statistics.

5 East Biddle Street.

LEFT-SIDED APPENDICITIS IN *SITUS INVERSUS VISCERUM TOTALIS*.*

BY

J. H. JACOBSON, M. D., F. A. C. S.,

Toledo, Ohio.

It is not at all infrequent to find a vermiform appendix in a situation other than the classical one at McBurney's point. Such abnormalities of position are, as a rule, associated with normal or typical positions of the other organs in the abdominal cavity. It is well known that the appendix may be found in any position along the course of the large intestine, due to arrested or faulty rotation of the cecum during fetal life. An abnormally long appendix, with mobile cecum, may be found in the pelvis or even well on the left side of the abdominal cavity.

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*Read at the Thirtieth Annual Meeting of the American Association of Obstetricians and Gynecologists, Newark, N. J., September 17–19, 1917.

An appendix may also be greatly displaced by abdominal tumors. When an appendix becomes inflamed in such cases, the clinical manifestations may appear entirely on the left side of the abdomen, making the diagnosis difficult. Such cases, however, are not true cases of left-sided appendicitis. Genuine cases of left-sided appendicitis are, strictly speaking, those associated with transposition of the abdominal viscera. My attention was called to this unusual condition by the following experience:

In May, 1916, I was called to a farmhouse by Dr. Babione, of Luckey, Ohio. The patient, a young man, aged twenty-four, was suffering from an acute abdominal condition. The illness was of three days duration, beginning with severe pain, which soon became localized over the left lower part of the abdomen; there had been severe vomiting and fever. Since the onset of the present illness urination had been frequent. The patient stated that he had occasionally in the past had attacks of abdominal pain.

On examination the abdomen was found distended and rigid, especially over the lower part of the left rectus muscle; the pulse was 125; temperature 104.2°F.; the patient was suffering intensely. There was a tympanitic note over the right hypochondriac region, the clinical picture being one of an acute abdominal visceral perforation. Examination of the urine was negative. In the course of the physical examination the attending physician stated that a number of years ago the patient had been told that his heart was on his right instead of on the left side of his chest. Up to this time the diagnosis was more or less obscure; the continued examination quickly revealed the dextro-cardia and the hepatic dullness in the left hypochondriac region. A diagnosis of left-sided appendicitis was accordingly made.

An incision was made through the left rectus muscle at a point corresponding to McBurney's on the right side. On opening the abdominal cavity a large amount of free pus was sponged out and very dense adhesions of the small intestines in the pelvic cavity were encountered. The density and firm organization of these adhesions was undeniably the result of previous inflammatory attacks. A perforated and gangrenous appendix was found hanging over into the pelvic cavity and attached to the left side of the pelvic wall, which was removed and a large tube and gauze drain placed in the pelvis. The post-operative treatment was by the Fowler-Murphy method. The patient made an uneventful recovery.

Three weeks later he developed severe abdominal pain and distention. I was again called and found him suffering from intestinal obstruction. The abdomen was opened and a dense obstruction found in the small intestine as a result of adhesions in the pelvic cavity. A lateral anastomosis by the suture method was made, but without avail, the patient succumbing on the following day.

My experience in this case led me to review the literature on appendicitis associated with visceral transposition. I found eleven other cases, and with the case which I herewith report, there are in all twelve cases, as shown in the following summary:

Case I.—Dreyer, W.—*Hospitalstidende* (Copenhagen), 1883, 3 R. 1:4. Female, aged thirty-four. Slight appendicular peritonitis in left hypochondrial region; vomiting and constipation. Palpation showed complete visceral transposition. Heart and spleen on right and liver on left, side. Operation not stated. The author says that the tenderness and resistance on left side of abdomen were due to a mild appendicular peritonitis.

Case II.—Bregi.—*Med. Mod.*, 1897, viii, 643. Male, aged twenty-three. Fell in gymnasium, pain in left iliac fossa, no stools; no gas; no anuria; abdomen painful, walls contracted; rapid pulse; vomiting; extremities cold. Intestinal occlusion with peritonitis. No operation. Died two days after injury. Autopsy showed inversion of viscera; peritoneum filled with pus. In left iliac fossa cecum adherent to wall and the appendix outside and behind it with violet colored extremity, size of little finger. Ecchymotic inflammation of cellular tissue of iliac fossa where appendix rested. Appendix fixed by adhesions. Total situs inversus.

Case III.—Rathkowsky.—*Berlin klin. Wchnschr.*, 1899, xxxvi, 263. Male, age not stated. Recedent left-sided attacks. Symptoms referred to left iliac region; circumscribed peritonitis. Symptoms had persisted since sixth year. Resembled chronic appendicitis, left-sided. No operation. Palpation disclosed total situs inversus.

Case IV.—Hebblethwaite, H.—*British Medical Journal*, 1907, ii, 1579. Male, aged sixteen. Abdominal troubles. The probable transposition of the appendix into the left iliac fossa led to the suspicion that that organ was the seat of the abdominal troubles. Treated expectantly but as symptoms continued was operated. Result, recovery. Transposition of abdominal viscera found at operation. In left side abscess and gangrenous appendix.

Case V.—Latzel, R.—*Situs inversus viscerum* und Toxische Nephritis und Cystitis im Anschluss an Appendicitis. *Mitt. a. d. Geselschr. f. inn. Med. u. Kinderheil k., Wien.*, 1908, vii, 118. Male, aged twenty-two. Good health till 1907, then cough, gastroenteritis, etc. April, 1908, abdominal symptoms of appendicitis; diarrhea, vomiting and pain especially on left side. Palpation showed situs inversus, which was confirmed by *x*-ray. Simultaneous appendicitis and nephritis. Treated medically. Result, not stated. Clinical demonstration of patient only.

Case VI.—Pool, E. H.—Complete Transposition of Viscera in a Case of Diffuse Appendiceal Peritonitis. *Annals of Surg.*, 1912, lvi, 940. Male, aged fourteen. Abdominal pain, vomiting. Pain in left lower quadrant. Diffuse peritonitis, appendix probable cause. Abdomen opened in right lower quadrant. Appendix not found. Opening extended. Sigmoid recognized. Visceral transposition suspected. Verified by making incision in left side. Appendix found. Result, recovery. *X*-ray showed complete thoracic and abdominal situs inversus.

CASE VII.—MÜHSAM, R. *Berlin klin. Wchnschr.*, 1911, xlviii, 1399. Male, aged twenty-one. Acute abdominal pains. Left-sided appendicitis (Mosse). Operated by Mühsam with left-sided incision; organs demonstrated totally reversed. Result, recovery. Inversion of viscera known for fifteen years previously, which was established by Röntgen-ray and palpation. Patient shown at Society Meeting.

CASE VIII.—HOLLENBACH, F.—Ein Fall im Appendicitis bei *Situs Inversus Totalis. Deut. Med. Wchnschr.*, 1912, xxxviii, 850. Female, aged twenty-eight. Pains in left side at point corresponding to McBurney's point on right. Vomiting. *X*-ray examination demonstrated complete intransposition of viscera. Diagnosed after *x*-ray examination as left-sided appendicitis. Typical appendicitis operation. Left-sided incision. Transposition verified. Cecum and appendix on left side. Result, recovery. Patient had operation for floating kidney in 1907, and a ventrofixation in 1908, also a right oophorectomy. During none of these was inversion of organs discovered.

CASE IX.—PODEVIN, P. and DUFOUR, H.—Appendicite chronique à gauche inversion totale des organs. *Bull. et mém. Soc. méd. d. Hôp.*, Paris, 1913, xxxv, 215. Female, aged forty-two. Pains in left side at point corresponding to McBurney's point on right. Palpation, bismuth meal and radiograph demonstrated complete inversion of visceræ of thoracic and pelvic regions. Chronic appendicitis. Not operated upon. Author says if operation is necessary, left side must be opened.

CASE X.—THIERRY, P.—Un cas d'erreur de diagnostic dû à une inversion viscerale totale. *Bull. et mém. Soc. de chir.*, Paris, 1914, xl, 1001. Male, aged twenty-four. Two months of abdominal pains in right side (iliac fossa); vomiting later. Appendicitis. Appendix not found, but colon. Examination showed sigmoid was being dealt with, operation not further proceeded with. Subsequent radiography, etc., showed complete inversion of visceræ.

CASE XI.—REID.—*Edinburgh Med. Jour.*, 1836, xlvi. Male, aged seventeen. Colic and other abdominal pains. Case described as death due to ileus. No operation. Result, died. Autopsy showed that all of large intestine was in the left iliac fossa. "The small intestines occupy that part in the abdomen where the large intestines are usually placed." Author does not mention other organs.

CASE XII.—JACOBSON, J. H.—*Transactions American Association of Obst. & Gyn.*, 1917, and present publication. Male, aged twenty-four. Illness three days' duration; general abdominal pain, becoming localized on left side. Urinary disturbances. Temperature

104.2, pulse 125. Rigidity of left rectus muscle. Diagnosis made from previous history of dextrocardia. Liver dulness on left side; classical history of appendicitis. Left rectus incision. Free pus in abdominal cavity, adhesions of small intestines in pelvic cavity. Acute gangrenous and perforated appendix removed. Result, died three weeks later of intestinal obstruction. Recovery from primary operation. Death due to intestinal obstruction from intestinal adhesions on the twenty-first day.

In an analysis of these cases it will be seen that in only three, which includes my own, was the diagnosis made previous to the operation and the appendix removed through an incision made deliberately in the left side of the abdomen. In three instances the condition was unsuspected and diagnosis made only after the abdominal cavity had been opened; in four cases a clinical diagnosis was made and the patient treated medically, no operation being performed. In the remaining two cases the condition was found only at autopsy.

It appears that Mühsam (in 1911) was the first to report an operation deliberately planned for left-sided appendicitis in the *situs viscerum inversus totalis;* Hollenbeck in 1912 reported the second, and my own case seems to have been the third. In Mühsam's case the transposition of the viscera was known for fifteen years before operation. Hollenbeck's case was diagnosed previous to operation by the *x*-ray; in my case the transposition of the abdominal organs was unknown before operation.

In all cases reported there appears to have been a history of previous attacks of abdominal pain. This leads to the conclusion that the condition was unsuspected, otherwise an early operation would have been done. It is difficult to ascertain the frequency of *situs viscerum inversus;* it is significant that up to 1906 Sorge(1) was able to collect only 214 cases. According to that author, the first *x*-ray picture of a case of visceral transposition was published by Vehemeyer in the *Deutsche Medizinische Wochenschrift* in 1897. The diagnosis of *situs inversus* is, as a rule, easy when a careful and thorough physical examination is made. It has, however, been made much easier by the *x*-ray. I have been informed by roentgenologists of experience, that dextrocardiac and visceral transposition are not exceedingly rare, as was formerly supposed.

Transposition of the abdominal viscera has led to a number of errors in diagnosis other than that of appendicitis; thus Arniell(2) refers to a diagnosis of inflammation of the liver on account of pain in the right hypochondriac region diagnosed as a wound of the liver; another was a spleen tumor, on account of the liver enlargement in the left hypochondriac region, and to a case of cancer of the pylorus diagnosed as a cancer of the pancreas.

It is fair to assume that with the increasing frequency of x-ray examinations, especially fluoroscopic examinations of the chest and digestive tract, a diagnosis of *situs inversus* will be more frequent. From the fact that acute abdominal diseases in such individuals are difficult of recognition, these patients should be carefully instructed so that in the event of an acute abdominal condition they may aid the physician in arriving at a proper diagnosis.

421 MICHIGAN STREET.

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THE THYROID IN GYNECOLOGY.*

BY

HERMAN E. HAYD, M. D., M. R. C. S. (Eng.),

Buffalo, N. Y.

I AM certain that no subject in recent years has received so much attention and provoked more scientific investigation than the endocrinic system of glands and no department of medicine has been more enriched by its possibilities than gynecology. The physiological chemistry of this little ductless gland, the thyroid, which when of normal size weighs only an ounce to an ounce and a half, but with a very rich and active blood supply, is exceedingly interesting. At first it was thought to be an organ with excretory functions, but now it is definitely settled that it provides, by its secreting cells, a product which gets into the circulation through the veins and lymphatics and influences the body metabolism, perhaps as an antitoxic, either by neutralizing and destroying certain poisons, the result of tissue change and disintegration from wear and tear, or by activating other interdependent glands, which go to make up the complex and complicated system, which is concerned in the elaborate functions of internal secretion.

In this short paper, it is my purpose to simply bring before you some of the conditions in the female, in which the administration of the dried extract of the sheep's gland is of signal value, without entering into a discussion of the deep and unsettled problems which are involved in the physiology and pathology of the many forms and expressions of goiter; of hypo- and hyperthyroidism, and other more or less ill-defined phases of physical instability, consequent upon an over- or under-activity of this gland.

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In a paper read before the Obstetrical Society in Baltimore, in 1897, Dr. William M. Polk of New York called attention to the clinical effect of thyroid extract upon fibroid tumors of the uterus. His report was interesting and, in a measure, encouraging; but few of us ever gave the treatment any serious trial, because the mortality with the modern supravaginal operation is so low that most cases of fibroid tumor are operated upon, when the indications for treatment are called for; and, surely, none are more pressing for immediate relief than hemorrhage, with its exhausting distress and dangerous possibilities.

In this connection, I have a very interesting case to report, not because I wish to recommend thyroid extract in the treatment of fibroid disease, but for the ill-determined hemorrhages in women, where the causes are obscure, until a diagnosis can be established and the best kind of subsequent treatment decided upon:

Mrs. S., aged forty-three years, three children, oldest thirteen, youngest five. She had always bled freely at her periods some times profusely, but for the past ten months, she was compelled to wear a napkin all the time because of the continuous dribbling and loss of blood. Sometimes she had to go to bed, as the hemorrhage was excessive. Her brother, a physician, sent her to a consultant, who prescribed thyroid extract and suggested a curettage for diagnostic purposes, and later more comprehensive surgery, if necessary. She did not take this good advice and continued to bleed until March, when I was called, as I had taken care of her in her two first confinements. I found her in a very nervous condition, very much swollen and puffy, extremely pale and anemic, with loud hemic murmurs and the usual symptoms and picture of prolonged and exhausting hemorrhages. Upon vaginal examination, the os was closed and the uterus in good position, apparently, not much larger than normal. A tentative diagnosis of a possible myxedema was made, and thyroid extract (Burroughs, Welcome & Company), in increasing doses, was given. At once the bleeding became less, strength began to return, and when after four weeks another vaginal examination was made, the os was found open and a myxomatous polyp, the size of a small plum, was protruding, which was easily removed without any anesthetic. The woman recovered very quickly and is now well, with good color, full of energy, and weighs 160 pounds. The thyroid in 2-grain doses was continued for some weeks with Blaud's mass, grains v, modified. I do not believe it was a mere coincidence that this polyp was found expressed during, but independent of, the thyroid treatment; because the bleeding was at once influenced and notably decreased after a few days of thyroid medication. She took 4 grains, three times a day.

The above case I have reported at length because of its pronounced and somewhat dramatic result, and yet I could detail a number of other encouraging experiences in the treatment of prolonged menstrual bleeding with thyroid therapy, when a previous curettage did not bring about the expected relief. Perhaps some of these cases were due to a general fibrosis of the uterus, or to some disturbed circulation in the organ, and not to a thickened and softened endometrium where curettage is usually effective.

In pelvic congestions, where the parts have a distinctly blue color, the cervix deeply ingested with blood, and the veins of the broad ligament distended and varicosed, with a general sagging of the pelvic contents, I always give thyroid extract, if tolerated, in conjunction with local scarification and depletion, hot douches, tamponage and cathartics. These women are often very constipated and the thyroid tablets act sometimes as a decided bowel stimulant and bring about two or more soft movements a day.

In the amenorrheas of young girls, where the periods are irregular or scanty, and even absent, or where the menstrual function has not appeared at the usual pubic period, I have of late years relied upon thyroid feeding, in gradually increasing doses; of course, in conjunction with good hygiene, proper living and exercise. Here I could detail the histories of many cases where menstruation was established after having been absent for months, or where marked irregularities existed, and normal function was brought about. It has been expressly valuable in those fat, pale, indolent, young women, who take little exercise and eat heartily especially of much sweet foods. Often when treatment was suspended, the irregularity would return, to be again relieved, both in time and amount of flow, by the administration of the thyroid.

A striking illustration of the potentiality of this remedy is seen in the following case:

M. J. aged twenty, and weighing 237 pounds. For some months she had been unwell for a day and instead of coming with regularity, would have her periods, say, at five weeks, or at six weeks, and then very scant in amount, but without any pain. For the past four months, she had seen nothing. She is of fairly good color, and still energetic in her work, but of late is depressed in spirits, and nervous and irritable. I gave her 1-grain tablets of thyroid three times a day and as she tolerated the dose well, I quickly increased them to 5 grains, and for a time 10 grains were taken three times a day. She saw her period at the proper time and was unwell five days, flowed freely, of good color, and without pain. She has continued the 5-grain tablet for months, and has been unwell regularly every month for over a year, and during the first six weeks lost 22 pounds in weight; but since that time there has been little appreciable loss, much to her discomfort and pardonable vanity, as she is a very handsome young woman, but with huge busts and hips, and as Locke would say, "deep-bosomed and broadbeamed."

Years ago, before I knew the value of the thyroid secretion in this class of cases, I curetted, inserted stem pessaries, gave electricity and other local treatments, but not with any degree of certainty and satisfaction, and perhaps often with harm to the unfortunate sufferer.

In the married, who have borne children, and who, after their first or second confinement, rapidly take on flesh and have a corresponding lessened menstrual flow, and with a constipated condition of the bowels, I have seen most encouraging results under thyroid therapy, but, unfortunately, many women do not tolerate this preparation, but when they do, the flow increases, the bowels become regulated, and a general sense of well-being results. The best index as to the patient's toleration during thyroid medication is the pulse, which very soon, either by its rapidity or irregularity or intermittency, warns us either to discontinue the remedy or reduce the dose, but when not effected, the dose can often be as high as 10 grains three times a day. Intolerance to the drug is also shown by tremor of the hands.

It has sometimes been of signal service in reducing the large goiters of young girls and young women, especially at or near puberty. The natural secretion of the thyroid gland is a colloid substance and in these hyperplastic or parenchymatous goiters developed during the adolescent period, there is often an excess of this material thrown out. This overproduction seems to be stored up in the gland and produces considerable deformity, but its absorption seems to be promoted by the stimulation the gland receives from the thyroid medication, sometimes a rapid retrogression taking place in a few weeks.

In the goiters of older persons, where cysts have developed, and where the growth is adenomatous, like in the so-called *struma nodosum* of the Germans, very little depreciation in size is effected by medication; but here operative procedures are very satisfactory in the hands of capable operators, without any mortality, and practically no resulting scar or disfigurement.

Some individuals do not tolerate thyroid medication. It causes in them gastric irritability and diarrhea, indigestion, violent headaches, dizziness, nervousness, twitchings of the face and extremities, tachycardia and dyspnea. Perhaps some of these gastric symptoms are due to poor preparations containing ptomains and leucomains, the result of old and decomposed products. However, many persons show a great intolerance to even very small doses, and I have assumed that in some of them these symptoms and this oversensitiveness are really an indication of an already overacting and irritated thyroid, when the bromides and other sedatives are of great value.

Tuberculosis, heart lesions, albuminuria and glycosuria seem to be strong contraindications for thyroid feeding. It is a specific in myxedema and cretinism, and it is said to be of benefit in certain chronic skin diseases, as psoriasis, and of signal service in obesity in the pale and flabby type, with edema of the extremities, some cases of chlorosis, in combination with tonics of iron and arsenic. In the young and vigorous type of fat girl, it seems to have little effect in reducing the weight and size of the individual.

The loss of weight in suitable cases is thought to be brought about by the destruction of the nitrogenous tissues, and still more by the wasting of the carbohydrates of the body. Of course, other measures can be effectively employed here, such as the reduction of the intake of fluids and food, as well as active and vigorous walking and exercises of all kinds.

Some authors have had good success with thyroid in treating various neuroses, neurasthenia, melancholia and different types of mental disease; others have thought that the ingestion of thyroid increased the flow of milk in nursing women. Some have written on its good effects in threatened and repeated abortions, and I hope the discussion to-day will bring out your experience in these several fields of work.

The etiology and pathology of many diseases are still very obscure, the full functions of the glands concerned in internal secretion are certainly unknown and theories and guesses are simply hazarded to explain the results of treatment in various conditions. Perhaps the recital of another interesting case may lead to suggestive lines of study and investigation, which, in the end, may prove of great value:

Miss L., spinster, aged thirty-eight years, thin and anemic, with regular but excessive menstruation; three or four napkins a day for the first two days, and at least fifteen to twenty for the period. She consulted me on account of her hands and feet which were painful, the movement of the joints produced pain, the tips of the fingers were hot and tingled and the color was of a very deep blue which extended well up to the first phalanges. I made the diagnosis of Raynaud's disease, and sent her to Dr. Putnam, neurologist, who concurred in the diagnosis, and suggested nitroglycerin, 1/100 grain, in gradually increasing doses. After a few weeks treatment, the medicine was discontinued; as there was no improvement and because it caused such distressing flushings of the face and disagreeable fullness in the head. I examined her thyroid and noted that it was unusually small and that the depression over the sternum was very deep; in fact, I could feel but very little gland substance. I decided to give her small doses of thyroid as an experiment and wrote a prescription for 1-grain tablets, (Burroughs, Welcome & Company), to be taken three times a day, with a very strict command that she return to me in a few days. The druggist, by mistake, gave her 5-grain tablets, which she took for four weeks, and then she came to my office because she was so nervous. She had a most distressed and anxious look and was breathing with difficulty; had a pulse of 130; the skin was cold and clammy; the muscles of the face twitched, and the hands and legs were jerked about in great restlessness. At once, I saw she was suffering from thyroid poisoning. The drug was stopped, and the toxic symptoms soon passed away. The discoloration of the hands and feet was so markedly improved, that I again sent her to Dr. Putnam, so that he might see what a pronounced change had been effected by the remedy. In a few days, I again commenced the thyroid in ½-grain doses three times a day, and then a grain was ordered, but this dose had to be again diminished on account of the developing nervous symptoms. The thyroid medication has been kept up for several months. The menstrual flow has decreased to a normal amount; the affected parts are pale, and the tingling stiffness and soreness of the digits have passed away. Both the hands and the feet are normal in color and function. She is still taking small doses of thyroid.

In my thirty-five years of practice, I have seen perhaps half a dozen cases of this somewhat rare disease and I confess that I have never known any medicine to influence its progress. All of the cases seemed to have gotten well, although some of them lost their nails and had superficial gangrenous areas, with sloughing. Of course, this one case is not sufficient to base any strong convictions upon as to the therapy of this disease, yet, I am convinced the thyroid was of signal value. It has suggested to my mind the possibility that there may be an explanation for Raynaud's gangrene in some disturbance of the glands of internal secretion, which causes the spasticity of the terminal vessels involved and by the administration of thyroid, a balance is brought about, so that the circulation in these terminal parts is restored to normal limits.

INTERRELATIONSHIP OF FEMALE SEX GLANDS AND THE PITUITARY BODY.*

BY

JAMES E. KING, M. D., F. A. C. S.,

Buffalo, N. Y.

During the past few years a mass of literature concerning the ductless glands has accumulated. One familiar with this literature is impressed by the fact that as yet the subject matter is concerned largely with theory. Facts are gradually being evolved by clinical study and experimentation, and each newly acquired fact affords another nucleus for further theory. These theories, however, serve the very useful purpose of directing thought and study and, as the facts become known the untenable theories will be displaced.

Of all the ductless glands, none has greater interest than the pituitary. As yet our knowledge of its physiology is fragmentary and the gaps must be filled in by theory. From this mass of fact and theory it would seem expedient that we begin to make some attempt to crystallize our knowledge clinically. The work of Cushing has done much in teaching us to recognize and understand the clinical manifestations of actual pituitary pathology. There is every reason to believe, however, that there are functional disturbances or lesser pathological conditions of the gland which we must and are beginning to recognize. Our attempts to study and explain the lesser pituitary dystrophies are still largely dependent upon theories and any discussion of the clinical side of the subject is of necessity more or less theoretical. The following is an attempt to call attention to certain clinical states that are apparently due to pituitary perversion, in the hope that in the further study of such cases, we shall be able to place them under proper classification.

Upon approaching the study of the ductless glands from any angle it must be clearly kept in mind that none of these glands acts entirely independently. The interrelationship is so close that disturbance of one gland will influence the secretion of one or more of the others. Hence the clinical manifestations presented are often very complex, indicating a perversion, not of one gland but of several. Correct diagnosis must then depend upon a most careful and searching analysis of the signs and symptoms presented. By this means only can the gland primarily at fault be determined and the possibility avoided of mistaking for the real offender a gland which is but secondarily involved. Further difficulties in the interpretation of symptoms lie in the fact that apparently similar active principles may be found in several different glands. For example, the blood raising principle that is present both in the pituitary and adrenals.

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What is known of the physiology of the pituitary gland indicates that it is a gland of far-reaching influence upon many vital processes. The gland is divided both by its anatomy and physiology into the anterior and posterior lobes. Physiologically the anterior and posterior lobes, up to a certain point, seem to have separate functions. The anterior lobe is the more vitally important. Its removal results in death within a few days. The function of the posterior lobe is somewhat better understood, for the reason that it is possible to remove it and the animal will live. Inasmuch as the functions of both lobes overlap more or less, it is not necessary here to draw a close and fine distinction. What facts we possess concerning its physiology have been obtained through animal experimentation and clinical study of its pathology. There are a few effects of normal pituitary secretion that must be taken into account in any clinical consideration. The most impressive effect is its influence upon metabolism in maintaining and promoting normal growth. A hypersecretion will stimulate growth both in the thickness and length of the long bones, while a hyposecretion retards bone growth. Equally well marked is its influence upon carbohydrate metabolism. If hypersecretion be maintained in healthy animals by the injection of large amounts of posterior lobe extract over an extended period of time, there will be a rapid destruction of body glycogens with ensuing emaciation. On the other hand, a hyposecretion will retard the oxidation of glycogens and a deposit of fat will result. In connection with this fact it has been found that in animals or man where such hyposecretion exists, large quantities of sugar can be ingested without its appearing in the urine. This is termed sugar tolerance and its application clinically offers a simple and reliable test for hyposecretion. By what means the pituitary controls or is a factor in the disposal of the carbohydrates, is not known. It may be through its influence upon other glands of internal secretion, perhaps the pancreas.

The gland apparently exercises an influence also upon mental characteristics. In the early stages of certain cases of acromegaly there is a hypersecretion. During this period the individual's mental activity is increased and his ability for brain work is much enhanced. Later as the hyper- gives way to hyposecretion, these same individuals become dull and stupid. In the clinical types of hyposecretion this is true and the facial expression of such patients plainly bespeaks their impaired mentality. Experimentation confirms clinical observations on this point, for animals from which the posterior lobe has been removed are not as bright and active as the controls.

Experimentation and clinical observation give abundant proof that the influence of the pituitary is essential to the normal development of the sexual organs and secondary sex characteristics. In the interrelationship between the pituitary and the male and female sex glands, we find most interesting, well-established facts for our consideration, and a wide and fertile field for theory and speculation. If the pituitary be removed from a young animal of either sex, before the secondary sex characteristics have appeared, the sexual organs will not develop to the adult state, but will retain their infantile type. On the other hand, should the gland be removed from an adult animal, retrograde changes take place, the genitals reverting to their infantile type. In diseased conditions of the gland causing a hyposecretion there will result either failure of the sex changes to take place or reversion to the infantile type, depending upon the age of the patient.

That the normal phenomena of puberty depends upon a proper interaction of the pituitary and sex glands is quite evident. At puberty rapid and striking changes are seen in both sexes. In the female menstruation and ovulation are established. The mammary glands are developed and there occurs the characteristic growth of hair. The girl grows rapidly and suddenly acquires the mental attributes of the woman. In the boy is seen rapid growth, disproportionate in the hands and feet. There is the characteristic lozenge-shaped growth of pubic hair. Spermatozoa develop in the testicles and the accessory sex glands become active. Mentally, he changes too, losing many of his boyish notions and acquiring view-points that are more mature. It is not difficult to recognize the pituitary here as the activating agent. The phenomena of puberty, however, cannot, of course, be entirely attributed to the pituitary, for we find that such changes are due to its interrelation with the sex glands. There is abundant proof of this in the results obtained by the removal of the testicles or ovaries.

While the foregoing concerning puberty are demonstrable facts, if we should seek to inquire why at the age of fourteen so important a relationship is established between the sex glands and the pituitary, we must take refuge in theory. That the sex life of the woman is further influenced by the pituitary is clearly evident. It is definitely known that the pituitary enlarges during pregnancy. A number of investigators agree that this hypertrophy is the result of an enormous increase in what have been termed "pregnancy cells." So great at times is the enlargement that pressure of the gland upon the optic nerves has caused temporary blindness. What effect this hypertrophy has upon its secretion is not clear. Whether there is an increase, a decrease, or only a change in the character of the secretion, has not been determined. It is a very common observation that women frequently put on weight during and following gestation. Glycosuria is also commonly seen during pregnancy. One occasionally even sees the facial changes—the thick lips, the coarse features, and the jaw enlargement that would hint of a mild acromegaly. The remarkable effect of injection of pituitary extract in producing strong uterine contractions suggests several plausible theories by which the occurrence of labor has been explained. Recently the pituitary has been regarded as an important factor in lactation, while indirectly, it may be, animal experimentation thus far has failed to demonstrate a specific action. It is true that immediately following injection of posterior extract in lactating animals there is an increased flow of milk, but it is probable that this is an apparent increase only due to the muscular contractions produced in the mammary gland.

The foregoing effects of pituitary secretion as influencing puberty and pregnancy are to be regarded as normal manifestations. Apparently, however, there is a rather delicate secretory balance and clinically it is possible to distinguish certain types in which the normal relationship is disturbed. It is impossible, however, from our present knowledge to place in clear-cut groups the less obvious evidences of pituitary perversion. It is not hard to understand why this is so. Our knowledge of the physiology of the gland is imperfect and, furthermore, the clinical picture is often that of a polyglandular disturbance. The border-line cases will also present an incomplete syndrome. The time of life, too, that the perverted pituitary first exerts its influence will be a factor in determining the clinical manifestations.

In the child-bearing life of the woman the evidences of pituitary disturbance will result almost uniformly in menstrual disturbance. Decreased menstrual periods, or even amenorrhea, are often the first symptoms which give the patient concern. It is usually because of this that she presents herself to her physician, and any other symptoms of which she may complain are attributed by her, and too often by the physician, to the menstrual disturbance. The careless observer may not recognize the other evidences of disordered glandular function. It is not our purpose here to discuss the well-defined types of pituitary perversion, such as Fröhlich's syndrome, gigantism, and acromegaly, but it is the less obvious examples of pituitary disturbance that may commonly be seen, but rarely diagnosed as such, to which your attention is asked. For one who keeps clearly in mind what is known of the physiology of the pituitary, the recognition of the abnormalities of secretion is not so difficult. Upon the presence or absence of the normal physiological effects must, of course, be based our facts for diagnosis. In the analysis of any suspicious case, we must not focus too closely upon any one gland, and that ever close interrelationship of all the ductless glands must be kept in the foreground.

In the clinical types presented we must acknowledge that our studies are far from complete, and it is only by the accumulated evidence of many observers that we shall finally reach some practical classification of these patients.

The first type is that of young women from sixteen to twenty years of age. The physician is consulted because menstruation, which began late, stopped completely after a few irregular, painful, and scanty periods. These young women appear to be in good health. There is a tendency to obesity. They may seem fairly bright, but upon careful inquiry it is often learned that they are inclined to be indolent and take but little interest in school. Except that there is a somewhat sparse growth of pubic hair, the external genitals are normal. The uterus is found to be small. A diagnosis of infantile uterus is made and the amenorrhea and the general condition are explained upon this basis. Clinical study of such patients would reveal an increased "sugar tolerance." Such are undoubted instances of mild hypopituitarism in childhood which results in the deficient development of the sexual organs, and which becomes apparent only at and following puberty.

A similar type of hypopituitarism presents a somewhat different picture. These patients have a fairly normal menstrual life before their marriage, excepting perhaps, that the periods are scanty. Within a short time after marriage they gradually and steadily increase in weight, and at the end of a few years the increase is pronounced. During this period the menstruation has been less frequent and more scanty, until there may be amenorrhea. Sexually, they are usually indifferent. Their expression is listless and the better defined cases may complain of drowsiness. The hands may suggest by their comparatively small size and gracefully tapering fingers the perverted pituitary. Here, too, the physician, finding a small uterus is satisfied to explain the entire syndrome as one due to infantile uterus. In these patients the pituitary disturbance occurred after puberty and, therefore, did not influence the phenomena of puberty, but found expression later in the amenorrhea and increase in weight.

The next type of hypopituitarism presents such clear-cut and characteristic features that it is even now entitled to a place as a clinical entity among the pituitary dystrophies. Our patient is a married woman, and makes her first visit to her physician because she believes herself pregnant. She may or may not have been previously pregnant. She recites in detail the various symptoms upon which she bases belief in her pregnancy. The periods have either ceased entirely or there has been but a trifling indication of them at long intervals. The abdomen has shown a progressive enlargement and there has been a rapid and decided increase in general weight. She insists that she has felt life. The physician may accept her evidence as conclusive, computes the date of labor and sends her home. Or perhaps he examines her. He finds a very fat abdomen and the examination is not satisfactory. Influenced by her statements, he may either agree with her diagnosis, or express uncertainty. Our patient, however, shares none of his doubts. She returns home and continues to make to the minutest detail her preparations for her confinement. On the date of the expected labor the patient has pains and the nurse is summoned. The physician arrives and finds all in readiness, and the family in a state of eager expectancy. He examines his patient to learn the progress of labor, and discovers that she is not pregnant! Upon his announcing this, the patient becomes indignant, calls him a fool, and may dismiss him on the spot. As far as he is concerned, with his pride a trifle ruffled, he regards it as a case of mistaken diagnosis and the incident as closed.

Upon a more careful scrutiny of such cases, they will be found to possess a characteristic syndrome. There is always a history of menstrual disorders, varying from skipped and scanty periods, to amenorrhea. The women put on weight very rapidly—50 to 60 pounds within a few months is not uncommon. Stomach symptoms are often present, even with vomiting. There is an intense longing for children and, when the menses cease they are convinced of their pregnancy, and are happy. As their condition progresses this belief becomes a certainty. They are completely dominated by this idea and they interpret all of their symptoms as due to pregnancy. In the face of expert opinion and strong evidence against pregnancy, their belief remains unshaken. It is a mental state, an obsession, an unreasoning conviction, that nothing can dispel except the failure of labor itself to take place. These women will be found to have a high sugar tolerance, which, together with amenorrhea and very rapid increase in fat, justifies classifying their condition as being the result of pituitary disorder. The predominating obsession of pregnancy makes it possible to place them in a distinct group, and in order to indicate the origin of their disorder, and, at the same time, to express the dominating feature, I would suggest the term "Pseudocyesis of Hypophysial Dystrophy."

These unfortunate women have afforded amusement and often embarrassment to the members of the medical profession. Most general practitioners have played a part in such cases, and every gynecologist has had the opportunity of acting on the question of pregnancy, as a court of last resort. Whether or not an internal secretion could or does influence so vital a process as reproduction, by instilling a love of offspring, is a question, of course, open to wide discussion. That mental processes are influenced by toxines and drugs is evident in the melancholias and psychoses of toxemia and the mental states produced by cocaine and opium. In the lower animals we see curious and interesting phases of maternal love. In animals in which we cannot expect to find a mother love as a result of mental reasoning, it is nevertheless present to a marked degree. In these same animals, after a period of time has elapsed, we see a complete revulsion of feeling, which would indicate clearly the loss of some powerful influence previously existent. There is no better example of strong desire for offspring, and tenacity of purpose in attaining the fulfillment of that desire, than the setting hen. She usually meets with decided discouragement, but, in spite of ill treatment and rough usage, she persists in her unreasoning conviction that she can hatch a chick from the door-knob upon which she so patiently and hopefully sits. Neither is there any better example of mother love than this same hen with her brood of little chicks. It is clear that the hen is impelled by some agency other than a mental process, which influences her to devote her entire energies to the consummation of her desires. Investigation has shown that the hypophysis of the setting hen hypertrophies, but it is not known what influence this hypertrophy has upon the amount and nature of its secretion. It is not unreasonable to attribute this vital process to the pituitary when we realize that it is responsible for such a remarkable phenomenon as hibernation. It is not difficult to find an analogy between the setting hen and the syndrome described as pseudocyesis of hypophysial dystrophy. There are wide chasms still to be bridged in this subject. To the student, it affords a most fascinating field for clinical research and study, and its promise for the future is rich in possibilities.

While clinically the subject of pituitary dystrophy is still in chaos, the therapeutics is even more discouraging. Manufacturers very generously placed at my disposal various pituitary preparations which were tried in a number of cases of pituitary dystrophy. The results were disappointing but not discouraging. They indicated that it is probable that treatment of these patients is a complex problem, and my experience convinces me that the solution of the question will come only after we have learned more of the balanced relationship of the endocrine system.

THE DIAGNOSIS, TREATMENT AND MANAGEMENT OF SURGICAL CONDITIONS COMPLICATING THE PROCESS OF GENERATION.*

BY

BARTON COOKE HIRST, M. D.,
Philadelphia, Pa.

In this paper I shall confine myself to questions still open to dispute and in addition will jot down in a desultory fashion, some peculiar personal experiences in operations on women during the process of generation, encountered in my hospital work in Philadelphia.

In labor complicated by anterior fixation of the uterus, by a former operation, and in incarcerated retroversion of the uterus during pregnancy, we have a valuable resource I think in abdominal section after efforts have been made to overcome the difficulty by taxis, or by other palliative procedures that seem to promise the best result. If, however, violent manipulation is required, unquestionably an abdominal section is preferable.

Under the head of ectopic pregnancy, two interesting points are open to discussion: First, whether we should remove both tubes

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when only one is involved for fear there might be a repeated extra-uterine pregnancy. In order to determine this point for my own satisfaction, a member of my staff analyzed the work of ten years in one of my clinics. In this time it appeared, I had operated on 167 ectopic pregnancies. Among these women, seven returned for a repeated operation on account of a tubal gestation in the remaining tube, but I got a report of thirty babies born after the removal of one tube for an ectopic gestation. If, therefore, both tubes had been routinely removed, these thirty infants would have been deprived of the right to life.

Another interesting point is whether to operate immediately in case of extreme anemia or whether to wait for a revival of the patient. The latter course seems to me unsurgical in the extreme. In the 167 cases just referred to, seventeen were operated on in a desperate condition from internal hemorrhage without waiting for an improvement of the patient's condition and of these cases, not one died. On the contrary, I have seen at least a half a dozen women lose their lives by delayed operation. They had bled to death before I could get to them or else were moribund when I first saw them.

An interesting mistake that I once made in an advanced extra-uterine pregnancy, in which the woman had gone on to full time and then had retained an overgrown fetus for four months, could have been avoided had I had an *x*-ray picture taken, which would have shown the baby's skeleton plainly. I have to confess that I regarded the tumor in the woman's abdomen which distended it extremely, as an ovarian growth and only found the true nature of the abdominal enlargement after I had opened the woman's abdomen. An 11 pound baby was removed with the whole gestation sac and placenta, with recovery of the mother.

During this winter, two cases of gall-stones have come under my notice with an exacerbation of an old cholecystitis in pregnancy, which as we know is not uncommon in that condition. I was forced to operate late in gestation but the operation did not interfere with the progress of pregnancy and the women were successfully delivered subsequently.

In dealing with ovarian tumors complicating pregnancy, I think we have all agreed that the tumor should be removed as early in gestation as it is discovered without fear of interrupting gestation; but if the tumor is only discovered late in gestation or during labor, it seems to me the most sensible course is a coincident Cesarean section and an oöphorectomy. I have done this several times and with success in each instance.

In fibroid tumors, we are all agreed I think, that as a rule the proper course in pregnancy is noninterference; except for two indications which have forced me to operate on several occasions: Extreme distention of the abdomen with excessive pain and kidney breakdown on account of increased intraabdominal pressure. In labor a Cesarean section is naturally required if the fibroid tumor blocks the pelvis, but even if it does not and if the tumor is large enough to demand removal at some time, here again it seems to me more sensible to do a coincident Cesarean section and hysterectomy.

On three occasions I have been obliged to remove fibroid tumors from the inguinal canal in child-bearing women. The tumors had grown with great rapidity during pregnancy and had reached the size of an orange at the time of the woman's delivery.

In dealing with acute appendicitis in a pregnant woman, an immediate operation is even more urgently demanded than it is under other circumstances. If this operation is done early in pregnancy, it, as a rule, does not interrupt gestation, but if the condition is allowed to progress to gangrene, perforation and suppuration, and if drainage is required, pregnancy is almost invariably interrupted, although I once operated on a woman four and one-half months pregnant with general acute, unlimited suppurative peritonitis requiring drainage after irrigation of the whole abdominal cavity. This woman strangely enough not only recovered, but went on to term and was delivered of a living child which has now grown to the age of some fourteen years.

In conditions demanding the speedy and complete evacuation of the uterus in early pregnancy, there is no operation comparable with anterior vaginal hysterotomy. If the speedy and complete evacuation of the uterus is demanded in late gestation, an abdominal hysterotomy should take the place of the vaginal operation.

We are frequently asked by our patients about the propriety of coitus during pregnancy. The answer given by all of us, I dare say, is that it should be limited as much as possible, but two experiences induce me to take a somewhat stronger ground in opposition to it. I have witnessed two deaths from coitus in the latter months of pregnancy.

In one case, there was an acute diaphragmatic hernia with almost the whole transverse colon pushed through the diaphragm into the chest. I operated on the woman but she came to me too late and died of the toxemia which is usually associated with strangulated hernia and complete obstruction of the bowel. The husband weighed 250 pounds; he had lost a former wife from the same cause and on the same night of the week, Saturday night. One is unavoidably reminded of Tristram Shandy's parents and the winding of the old clock.

In the other case, the woman came to my service in the University Hospital between seven and eight months pregnant with all the symptoms of severe internal hemorrhage. I naturally suspected premature separation of the placenta, but on opening the abdomen I found as extreme a degree of intraperitoneal hemorrhage as one sees in the worst cases of ruptured ectopic gestation. The cause of the hemorrhage was a slit on the posterior surface of the uterus extending about 2 inches in length and about a quarter of an inch in depth, involving the perimetrium and a portion of the myometrium. The symptoms of internal hemorrhage had begun after a coitus on the preceding night. I emptied this woman's uterus by a Cesarean section, evacuated the blood from the peritoneal cavity; sewed the womb at the site of injury; gave the woman an intravenous injection of salt solution during the operation which revived her satisfactorily, but as sometimes happens in these cases of extreme anemia, the revival from the salt solution was only temporary. I retained her husband in the hospital as a possible donor and when the woman's condition again became bad, actual transfusion by the citrate of sodium method was carried out with a gratifying result. Two days after the operation, the woman was apparently in perfect condition, but being left alone for a few moments, got out of bed, walked out of the room into the corridor and dropped dead suddenly from heart failure.

Pyelitis has furnished me in the past with an indication for nephrectomy occasionally when the infection spread to the substance of the kidney, but I do not anticipate a necessity for this operation often in the future; because with the two-way ureteral catheter, washing out the pelvis of the kidney and injecting it with a silver salt solution, we have pyelitis entirely under our control.

In an experience with a number of these cases in the last three years, I have been able to cure them all in a surprisingly short space of time; the average duration of the illness after the first treatment being less than forty-eight hours, although in some instances the women came into the hospital very ill.

I recall an interesting experience with hernia of the pregnant womb through an extreme diastasis of the recti muscles. At six months of pregnancy, the fundus of the uterus hung down to the woman's knees when she stood erect and there were such distressing symptoms from the drag upon the intraabdominal contents that I felt compelled to remove the uterus, at the same time doing a modified Webster operation to correct the diastasis.

Under the head of surgical injuries to pregnant women I recall three remarkable cases, not demanding operation but illustrating the extraordinary tolerance of pregnant women in some instances to traumatism. In one case a servant girl cleaning a third story window fell to the street; she fractured her skull; fractured her sacrum and broke one thigh. She was five months pregnant at the time, but her pregnancy was not disturbed. She recovered from her injuries and was delivered at term.

In another case a young girl, illegitimately pregnant, determined that she would not give birth to a living child. Accordingly she stabbed herself at the umbilicus with a long hatpin driving it in to its head. The only consequence was the discharge of a few drops of pus from the umbilicus for a couple of days. She accomplished her purpose, for she gave birth a short time later to a dead baby. It had been transfixed by the hatpin.

In another case, a young woman of good position finding herself illegitimately pregnant, attempted to commit suicide and at the same time to destroy the evidences of her condition, by shooting herself through the abdomen. She was five months pregnant at the time and instead of destroying the pregnant uterus, which I imagine she intended to do, she shot herself through the umbilicus missing the fundus uteri by about an inch. The bullet traversed the abdominal cavity and came out of her back, but fortunately did not wound the intestines. She recovered from the bullet wound and was delivered under my observation at term some four months later.

The operative treatment of placenta previa is a subject well worth discussing. I find myself treating about 90 per cent. of my cases of placenta previa by Cesarean section. So far I have not lost a case by this method. I wish I could say the same of the other kinds of treatment upon which I used to depend.

If in doubt, therefore, of my ability to deliver a woman easily by the bag method or by podalic version in a case of placenta previa, I am now resorting routinely to Cesarean section and I am sure it will be my practice in the future.

Under the head of ruptured uterus I differ from my friend, Dr. Norris. I would prefer the drainage treatment even in a hospital. If I see my way clear, therefore, to giving the woman any chance by a gauze pack drain, I would prefer it to an abdominal section, although I have had ample experience with the latter plan of treatment and as much success with it as one can expect under the circumstances. Occasionally, as we all know, a ruptured uterus is not amenable to any treatment. I recall one horrible case to which I was summoned in consultation, in which the attending physician had caught hold of a loop of small intestine and had then proceeded not only to pull out the whole 20 feet of the woman's small intestine but finally had pulled it off and dropped it in a bucket under the table on which the woman lay. This was the condition that I found on arriving at the consultation.

I recently had to deal with two cases of cancer of the cervix in pregnant women; in one the pregnancy was early, between three and four months; there was a superficial ulceration of the cervix which was regarded as suspicious. On removing a small piece of it and having it subjected to microscopical examination, the report of epithelioma was returned, in consequence of which I did a Wertheim operation with success. This was some two or three years ago and the woman remains at present in perfect health. She had been told by a professor of gynecology in Philadelphia after a mere inspection of the cervix, that she had not a cancer, but the family were not satisfied with this opinion and demanded another one. Had the advice of the first consultant been taken, the woman would have been dead long ago.

The second case came to me in my hospital service near term. In her I did a coincident Cesarean section and extended panhysterectomy. This procedure has been criticised on the ground that it would have been better to do a Cesarean section first and after the woman had recovered from that operation to do the panhysterectomy, but I cannot see the reasonableness of subjecting such a patient to two successive abdominal sections within a comparatively short space of time.

One of the interesting cases which came to my service this winter was an example of conglutinatio orificii externi uteri, the result of a previous operation for lacerated cervix performed by a general surgeon. A similar case I happen to know was seen in Dr. Norris' service in the Philadelphia Hospital, also the result of a plastic operation by a general surgeon.

I see so many of these unfavorable results in plastic work, particularly that done by the general surgeon, that I have had it in mind for some time, to advertise a public clinic for the benefit of my colleagues in Philadelphia who are general surgeons and who nevertheless will persist in doing these special operations on women. I entertain the hope that by this means we can secure some improvement in the result of the general surgeon's work if he insists on doing this special surgery. As is well known, it is perfectly easy to deal with these cases of conglutination of the external os by an incision in the overdistended lower uterine segment, the center of the crucial incision corresponding with the site of the external os. Finally, like everyone else, in this department of medicine, I have had to deal with a number of conditions in the vulva complicating the process of generation and requiring surgical treatment. One of the most interesting of these conditions to me has been elephantiasis of the vulva, on which I have operated several times, but in each instance have been able to postpone the operation until after the woman's delivery.

FETAL DYSTOCIA AS AN INDICATION FOR OPERATIVE DELIVERY. THE RELATIVE PROPRIETY OF SUCH PROCEDURES AS THEY AFFECT THE INTERESTS OF MOTHER AND INFANT.*

BY

JOHN A. McGLINN, A. B., M. S., M. D.,

Philadelphia, Pa.

THE title of this paper presents a subject too comprehensive to be considered in its entirety in a single communication. Fortunately, many of the causes of fetal dystocia are so rare and the question of their treatment so settled that they do not require discussion. Therefore, we will not consider such causes of fetal dystocia as hydrocephalus, premature ossification of the bones of the head, monstrosities of various types, general ascites, cystic kidneys, etc. Again, I take it, that part of the title "As An Indication for Operative Delivery," does not mean such obstetrical operations as forceps and version or destructive operations on the fetus such as craniotomy and embryotomy. With these eliminations the subject can be discussed from the standpoint of malpositions and presentations of the fetus as indications for abdominal Cesarean section or pubiotomy and the relative propriety of such procedures as they effect the interests of the mother and infant. Even this subject is rather large to cover in the time allotted me and I will consequently limit myself to a short discussion of a few phases of the subject.

It is hardly necessary for me to discuss with this audience the relative rights of the mother and infant. Very few men would have the temerity to advocate at the present time destructive operations upon the live fetus as a method of delivery. That such operations are done occasionally does not make them right. They are simply evidence of the stupidity or neglect on the part of the attending physician or the ignorance or cupidity of the patient. It is our duty as obstetricians not only to act but to teach that the best interests of both mother and child, not only at delivery but for the rest of their natural lives, should be conserved. It is not enough that a living mother and child should be the end result of a pregnancy and labor. It is almost equally as important that neither the one or the other should be left in a state of permanent morbidity. This is a phase of the subject that is generally overlooked.

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Let us first consider the propriety of Cesarean section in breech presentations. This procedure has recently been advocated by J. T. Williams and combatted by Ross McPherson. All authorities are agreed that both maternal and fetal mortality and morbidity are higher in breech presentations than in uncomplicated cephalic ones. The maternal mortality is variously estimated from 5 to 20 per cent. and the fetal mortality from 10 to 30 per cent. Maternal mortality is increased because the incidence of both puerperal infection and postpartum hemorrhage is greater. The incidence of infection is increased because the majority of cases require manipulative delivery with consequent danger of infection of the birth canal. Infection is also more common on account of the more frequent lacerations of the cervix and birth canal, the perineal tears sometimes being so extensive as to open up an avenue of infection by tearing into the rectum.

The incidence of hemorrhage is increased for the reason that the majority of breech labors are protracted and as a result there ensues a condition of uterine atony. Hemorrhage is also caused by extensive lacerations of the cervix when it is necessary to drag the head through the undilated canal.

Maternal morbidity is increased for the same reasons that mortality is increased. Fortunately, comparatively few women affected die of hemorrhage or infection but they all suffer in varying degrees as the result of these two conditions. There is no question that traumatisms of the birth canal are more frequent and extensive than in uncomplicated cephalic presentations. In spite of our best efforts and skill many of these women are left in a state of chronic invalidism or require extensive and at times unsatisfactory operative procedures for their relief. The incidence of fetal mortality and morbidity is increased in breech presentations. The most common cause of fetal death is asphyxia due either to pressure on the placenta or cord by the after-coming head or else to intrauterine respiration due to reflex stimulation by change of temperature on the part of the fetus first escaping from the birth canal. Mortality is also increased by the traumatisms to the child during delivery. Fetal morbidity is greatly increased as injuries to the child in the act of delivery are frequent. Such accidents as fracture of the femur or dislocation of the hip in bringing down a leg; dislocation of the shoulder or fracture of the humerus or clavicle in disengaging the arms; injuries to the mouth and lower jaw in the delivery of the head. Injuries to the cervical vertebra and cord and injuries to the head resulting in various palsies are far too common.

It is impossible to present exact figures as to mortality and morbidity of mother and child, but that they are much higher than in cephalic presentations, there is no question. McPherson states that the maternal mortality in uncomplicated breech labors should be no higher than in uncomplicated head cases and gives the mortality as 0.47 per cent.

Including the complicated cases his mortality was 0.96 per cent. While this is a record to be proud of, unfortunately for the purpose of study, these statistics are not of much value. They are too general and do not individualize at all. No mention is made in his paper of the incidence of maternal morbidity. His figures as to fetal mortality are as follows: In 336 children at term the mortality was 9.4 per cent. Including all the stillbirths the mortality in primiparous women was 21.6 per cent. and in multiparous women 22.7 per cent. Unfortunately he says nothing of the degree of prematurity of the children which he discards to obtain the fetal mortality of 9.4 per cent.

While these are the only exact figures I could find in a hurried search of recent literature and while they apparently are lower than those usually given in standard text-books, I still believe that we are all agreed that both maternal and fetal mortality and morbidity are higher in breech labors than in cephalic ones. This is particularly true as regards morbidity.

This being so, the question arises, shall we rest content with our present methods of treating these cases or have we a method that will give better results. At first thought it would seem that abdominal Cesarean section would be the procedure of choice. The operation is so easy and in the properly selected case and in the hands of the competent man, the results are so brilliant that we are constantly extending its field of application. Extending them too far, I fear at times and discarding other tried obstetric procedures to the detriment of the patient.

In the case of breech presentations it must be admitted that the mother would be spared much of the morbidity that results from extraction and that the mortality and morbidity of the fetus would be practically eliminated. In the interest of the child, there is no doubt that this operation would be entirely a justifiable one and we might argue that it should be the method of choice in every case.

In the interest of the mother, however, the justice of it is not quite so clear. In the first place, Cesarean section, even in the selected case, presents a definite danger as to life. Small, it is true but nevertheless present. In the unselected case, the mortality is high. While section can be done in the selected case with a mortality of less than 1 per cent., many of the cases of breech labor would not be in any sense selected ones. If the cases were seen early before the onset of labor and an external version failing, were sectioned at an elected time, the mortality rate would be exceptionally low. If the cases were seen, however, after labor had been in progress for some time, with the membranes ruptured and frequent vaginal examinations having been made, the mortality would be much higher than by extraction.

Nor is mortality the only question to be considered as far as the mother is concerned. It is true that the morbidity resulting from traumatisms of the birth canal would be limited, but the operation would produce morbidity perhaps equally as serious. The danger of rupture of the uterus in subsequent pregnancies at the site of the Cesarean scars is a serious one.

Findley estimates this accident at 2 per cent. and other authors even higher. Rongy states that the dictum "once a Cesarean, always a Cesarean" holds true in 75 per cent. of cases. While I am not in accord with this dictum, I do believe that every cesareanized woman should be carefully watched and delivered in a hospital in subsequent pregnancies. Proper suture of the uterine incision and the proper selection of cases with proper technic to prevent infection will reduce the danger of rupture.

McPherson argues that if we take the primary mortality of Cesarean section and add to it the mortality resulting from rupture of the uterus in subsequent pregnancies and compare it with the mortality of extraction, the results are altogether in favor of the latter procedure. Statistically, this seems to be so. What then shall we do? Shall we in the interests of the child adopt a procedure that will increase the risk to the mother or retain a procedure in the interests of the mother, to the detriment of the child?

This question, like most questions in medicine, cannot be answered in generalities. It must be answered in the individual case. I am firmly of the opinion that Cesarean section is a justifiable operation both for the best interests of the mother and infant in some cases of breech presentations. I am equally sure that it would be an unjustifiable procedure in many, perhaps the majority of cases. While I am an ardent believer in the rights of the unborn child, I am consequently just as an ardent believer in the rights of the mother. We have no more right to needlessly jeopardize the mother in the interest of the child than we have to needlessly jeopardize the child in the interest of the mother. Consequently, I do not believe the operation to be justified except under very exceptional circumstances except as an elective procedure. In a general way it would not be indicated in multipara with normal pelves and with living children.

Under what circumstances would it be justifiable? In elderly primipara where there is a possibility of this being the only pregnancy. In primipara with rigid soft parts, particularly of the cervix where the resulting traumatisms to the mother and child might result disastrously. In women with moderate degrees of contraction to whom the danger to the infant had been imparted and they elected section, in the interests of the child. The operation might also be justified in many other types of cases which cannot be enumerated offhand in a general way. Every case must be individualized and treated in accordance with the problems presented.

I have operated in several cases of breech presentations with the most happy results. In several other cases that I can recall I did not have the courage to advise a procedure so out of the ordinary where the results were most disastrous. One case in particular, a primipara aged thirty, was delivered of a still-born baby after a difficult extraction. The parents were most anxious for a child, years have passed and the woman remains sterile. I learned only recently that they have adopted a baby. I lost not only the baby, the good-will and friendship of very dear friends but acquired their enmity.

Another case was delivered of a live baby which developed on the second day a paraplegia due to cranial injury. Fortunately, this child since died and was thus saved a life of suffering.

Another case seen in consultation was delivered by craniotomy on the after-coming head after futile attempts had been made to deliver by extraction. In this case, there was complete separation of the cervical vertebra. Had this child survived it would have been a hopeless paralytic. I am sure that all of us can multiply such unfortunate experiences. With these experiences in mind and recalling the dangers of maternal and fetal morbidity, I feel sure that we can advocate Cesarean section in many cases of breech presentations.

What shall be done in cases of persistent chin posterior with a living child, where it is impossible either to flex or rotate the head? Recently pubiotomy has been advocated in these cases. While I have had no personal experiences, I would rather elect abdominal delivery. Sufficient additional room can hardly be obtained by a pubiotomy to deliver as a chin posterior. The best that can be hoped for is to obtain enough room to liberate the head, rotate anteriorly and deliver by forceps.

The traumatism of the delivery plus that of the operation would certainly result in a greater morbidity than would accrue by section. The cases would certainly not be favorable ones for section on account of the danger of infection but nevertheless I feel that taking everything into consideration, section would be the safer procedure. The mortality of pubiotomy in the unselected case is as high if not higher than that of Cesarean section and the morbidity considerably greater.

The question as to the proper treatment in overgrowth of the fetus resolves itself into the study of the individual case. It is a difficult problem to accurately determine the exact size of the fetus and it is impossible to determine the mode of treatment without a test of labor. In other words, the treatment of overgrowth of the fetus is the same as a normal child in a moderately contracted pelvis. In cases of repeated overgrowth of the fetus where delivery has been accomplished with difficulty resulting in a dead or maimed child, it is justifiable to elect Cesarean section without the test of labor. Pubiotomy has no place in the treatment of this complication.

I regret that time will not permit of a discussion of dystocia due to abnormalities of the fetal appendages. The question of operative delivery in cases of accidental hemorrhage and placenta prævia is an important one but the subject is entirely too comprehensive to present except as a special communication.

113 SOUTH TWENTIETH STREET.

THE DIAGNOSIS AND TREATMENT OF GALL-STONES.*

BY

GEORGE TULLY VAUGHAN, M. D., F. A. C. S.,

Washington, D. C.

WHEN one can look back over a series of patients who have passed through the hands of various experts, including eminent gastroenterologists and have been treated for indigestion, appendicitis, gastritis, ulcer of the stomach or bowel, peritonitis, salpingitis, endometritis, etc., and the final analysis proves that all the symptoms were caused by gall-stones or their complications, he is forced to one of the following conclusions: that diagnosis is exceedingly difficult, that our methods used in attempting to make a diagnosis are crude or imperfect, or that many physicians are guilty of a lack of thoroughness in examining their patients or in interpreting the results of their examinations. I believe that all of these reasons exist in greater or less degree. There is no doubt that at times not only is the diagnosis exceedingly difficult but impossible. Take a case of gall-stones with acute cholecystitis. To differentiate it from a perforating ulcer of the stomach or duodenum, acute pancreatitis, or appendicitis, is at times impossible. In all four diseases there are pain, fever, perhaps a chill, vomiting, and leukocytosis. The pain and tenderness may be in the right hypochondriac region in any one of the four diseases. The previous history throws no light on the diagnosis. A Röntgen ray examination may be made but shows no gall-stones although they may be present. The amount of cholesteremia may have been estimated. The patient may be very fat, so that palpation gives little information. In such cases, by no means infrequent, the surgeon is reduced to the necessity of guessing which one of perhaps half a dozen conditions is present. There is no doubt that he is confronted by an abdominal catastrophe which requires laparotomy and if he is wise and experienced he will reserve his diagnosis until the abdomen has been opened. In an ordinary case of stones in the gall-bladder attempting to pass through the cystic duct, the agonizing pain in the epigastrium and right hypochondrium, radiating toward the back and the right shoulder and perhaps along the esophagus, the chills and sweats without fever and the tenderness over the gall-bladder, make the diagnosis pretty certain. If in the common duct, the pain, jaundice, and fever, intermittent in character, indicate a movable stone acting as a ball valve in the duct. What often puzzles the surgeon is a patient who has had a history of gall-stones and cholecystitis without jaundice or only a transient attack. Cholecystostomy with removal of the stones and drainage is done. The discharge continues for six months or a year, closing at times as if about to heal, every time accompanied by a chill and a rise of temperature but no jaundice. The temperature and pulse return to normal as soon as the discharge is reëstablished. What is the cause of this persistent discharge? Is it a suppurating gall-bladder, a cholangitis, a retention of stones or a combination of two or more of these conditions? There is no tenderness or enlargement of the liver and no jaundice when the discharge through the fistula ceases; therefore cholangitis and impacted gall-stone in the common duct are excluded and the gall-bladder is blamed for the trouble and is excised. The patient improves for a while but as soon as the discharge ceases the old symptoms return. A subsequent operation reveals the presence of a stone in the ampulla of Vater and its removal is followed by prompt and permanent recovery. Why is it that the patient had no jaundice when the external discharge ceased and the temperature rose with an impacted stone in the ampulla? The only explanation apparent is that some bile and infectious material escaped around the stone but not enough to prevent absorption in the absence of the external drainage. Such cases are very puzzling.

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* Read at a meeting of the Washington Obstetrical and Gynecological Society, January9 , 1917.

The diagnosis made, one might think that the matter of treatment is easily settled by transferring the patient to the surgeon for operation. While this may be true generally, there are still some physicians who insist on giving Carlsbad salts, phosphate of sodium, and olive oil, not only to prevent the formation of stones but to produce their evacuation after formation. One highly respected gentleman has explained the action of the olive oil by claiming that it insinuates itself into the ampulla of Vater from the duodenum, oiling the ways and even getting behind the stones and assisting in propelling them along the oily route. I do not mean to belittle the use of medicinal remedies at the proper time but when used with the idea that they can dislodge a concretion in the living tissues as the chemist dissolves it in a test-tube of glass, or do other equally improbable things, it is time to call a halt and ask for a change. If Aschoff's theory of the formation of gall-stones is correct, that it is cholestrinemia in which the blood becomes supersaturated with cholesterin and can no longer hold it in solution so that it is deposited in the form of concretions, it would be rational to treat those who have been relieved of gall-stones or those who have an excessive amount of cholesterin in the blood by regulating their diet and exercise and the administration of medicines which might prevent or relieve this condition of the blood.

In considering the treatment by surgical operation, a choice of many procedures are presented, but the most important are cholecystostomy and cholecystectomy. Other operations are choledochostomy, choledochenterostomy, cholecystenterostomy and the formation of a new common duct. There is yet a great want of agreement among surgeons as to the removal of the gall-bladder.

One extreme group advises removal in all cases when any operation on the gall-bladder is indicated unless there are contraindications. The other extreme group would remove it only when absolutely demanded as in malignant disease and gangrene. I heard one man say that he saved a gall-bladder that was partly gangrenous. The middle class which probably comes nearest to adopting the best procedure preserves the gall-bladder whenever that seems advisable and removes it when its retention would be a menace to the patient or its function is destroyed. It is just at this point that men differ as to what constitutes a menace. The healthy gall-bladder undoubtedly has a function, but that it is not essential to life or health seems proved by the good health of the many persons who have lost their gall-bladders either by disease or by surgical operation. The elephant, rhinoceros, horse, ass, and some deer, normally are without gall-bladders. I would not remove a gall-bladder which is normal as I would an appendix, but it seems to me that any case of disease of the gall-bladder sufficient to require an operation is sufficient justification for its removal. If left behind it is apt to lead to the recurrence of stones, or fistula or probably contracts, atrophies, and becomes functionless. At least I have found it so in several cases in which opportunity was afforded to examine the organ some time after a cholecystostomy had been done. When prolonged drainage is needed as in repeated cholangitis, the gall-bladder may be used for external drainage or drainage into the bowel by a cholecystenterostomy. But a T-shaped rubber tube is probably better, and sometimes a choledochenterostomy can be done.

While the gall-bladder is generally conceded to be the place where stones form in the large majority of cases, it is well known that they also form in the small ducts and in the substance of the liver and perhaps also in the larger ducts—bile, hepatic and common. So when there is recurrence after removal of the gall-bladder the explanation is quite simple—either that a stone in some of the ducts was overlooked or that one has formed since the operation.

At operation it is important to see that the common duct is clear, provided that circumstances, especially the condition of the patient, will permit the exploration. Even under favorable conditions it is seldom possible to pass an instrument through the gall-bladder, cystic duct and common duct, into the bowel. With the gall-bladder removed it is easy to pass an instrument through the stump of the cystic duct or through a slit in the common duct down into the ampulla of Vater and sometimes into the bowel. Unless the probe passes into the bowel we cannot be sure that the ampulla is not obstructed. It is then that the injection of water or salt solution into the common duct by means of a syringe will not only determine its patency but will sometimes wash out stones that may be lying there.

THE McDONALD SOLUTION.*

BY

CHAS. S. WHITE, M. D., F. A. C. S., AND OSCAR HUNTER, A. B., M. D.,
Washington, D. C.

In July, 1915, Ellice McDonald, of New York, published a report† of a germicidal solution with which he had been experimenting, consisting of:

Acetone (commercial)	40 parts
Denatured alcohol	60 parts
Pyxol	2 parts

which has since been known as the McDonald Solution.

The purpose of this solution is to disinfect the hands of the surgeon and the skin of the patient in surgical practice, and he claims for it the following advantages: "It is reasonably cheap; it does not irritate the skin, as I have proved by many thousand immersions of my hands and arms; it contains a fat solvent—acetone—which causes the solution to penetrate; the alcohol is a good vehicle; it contains a strong germicide twenty times as germicidal as carbolic acid in equal strengths."

Pyxol is said to have the following composition:

40 per cent. pyxol oil
30 per cent. neutral hydrocarbon oil
30 per cent. saponified vegetable oil

He claims to have better wounds and less inflammation than before. McMullen and Stanton, both of Schenectady, attest to its value in a large series of cases.

We began the use of this solution in the autum of 1915 without preconceived opinions regarding its efficiency and are prepared to submit a report which in some respects does not bear out all that is claimed by the originator of this preparation.

Our clinical experience has extended over a period of eighteen months, using the iodine method of preparation as a standard of comparison. All the cases were conducted under practically similar technical conditions and any deviation from the routine was so slight as to be negligible. All cases were clean ones and comprised those usually met in a general surgical practice.

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* Read at a meeting of the Washington Obstetrical and Gynecological Society, March 9, 1917.

† *Surgery, Gynecology and Obstetrics.*

The first series with the McDonald solution was of one hundred cases at the George Washington University Hospital and we had an infection in eight cases; in six the inflammation was superficial and apparently originated about a suture; in two the inflammation was deep, but in none of the cases was the inflammation serious. The remaining ninety-two healed by first intention. We placed in the infected class those cases which showed the solution of the subcutaneous fat, seepage from a wound, and the smallest amount of pus about a stitch. During this period accurate records were kept of one hundred cases operated upon with the iodine method of skin sterilization, as employed by the other surgeons at the hospital, probably twenty operators in all. This hundred cases showed sixteen infections, or just twice the number of those of the McDonald series. On this showing alone the McDonald solution seems to have a clear advantage over the iodine method. Sterilization of the hands of the operator and his assistants by the McDonald solution was started when the series began, but, after two weeks trial of this solution, a dermatitis developed upon the hands and arms of all those using it and it was found impossible, because of the intense irritation, to continue its use. Having used bichloride of mercury previously for hand sterilization, it was thought possible that this predisposed to this irritation, so we employed students to use the McDonald solution who had never used bichloride of mercury for any length of time, but the same dermatitis followed.

A second series of cases was started in October, 1916, and, in the first ten, two severe deep infections were noted, one of which required a secondary operation for closure of the wound before the patient could be allowed to leave his bed. At this time our attention was called to the report of Bottomly at the Sixth Annual Session of the Clinical Congress of Surgeons, on the end results of cases operated upon. In the ten cases at the Carney Hospital using the McDonald solution for preparation, four infections followed, three of which were fatal, a fearful mortality. He states in explanation: "At the time of the operations it was stated that our use of McDonald's solution was tentative only. The objections to it, noted at that time, were that the coal-tar derivative employed was a proprietary preparation, the exact composition of which was not known and that it was put on the market as a household and general disinfectant and bactericide, without guarantee as to its strength or purity. These points in themselves should have been sufficient for its rejection, but we were influenced by the enthusiastic reports of others, and did not make bacteriological studies *before* adopting it. Attention is called to the difference between the results of the orthopedic and other services as to sepsis. Practically the only difference in the technic was in the method of preparation of the field of operation, the tincture of iodine and not the McDonald solution being used in the orthopedic cases."

Since we abandoned the use of McDonald's solution we have a series of fifty clean cases prepared with the tincture of iodine, but in all other details following the same technic. We consider this comparison more just than the series in which a score of operators were using the iodine method.

In the series of fifty there has been but one infection, subcutaneous in nature, and in a patient suffering with a gunshot wound in which the abdomen was opened within a few hours after admission to the hospital. No washing of the skin with soap and water and alcohol was possible from lack of time, merely the two coats of iodine applied. The subcutaneous fat was infected but healed completely in two weeks. The contrast between this series of fifty with an infectious morbidity of 2 per cent. and the McDonald series of one hundred with 8 per cent. was sufficient to point a moral, namely, the superiority of the iodine preparation.

The efficiency of any disinfectant solution depends upon quite a large number of factors, which may vary and give rise to marked differences in the final result.

Bacteria of different species exhibit considerable variations as to their resistance to germicidal solutions and indeed, different strains of the same organism may show astounding differences in degree of resistance. This latter condition, according to Zinsser, is probably the result of temporary or permanent biological differences produced in bacteria by previous environmental conditions.

Another element entering into the success of a disinfectant is that it should come in direct contact with the bacteria and for this reason, it is of the greatest importance to choose the most appropriate disinfectant for the particular material to be disinfected.

Considerable differences in the resistance of organisms are also exhibited in marked variations of the temperature of the solution used. The number of the bacteria exposed to the disinfectant is another important factor. In disinfection of the hands and skin, we are limited to a few agents, particularly those of a chemical nature.

The surgeon and bacteriologist have been striving to produce a fluid which will disinfect the hands completely and quickly without injury to the surface epithelium. A great number of solutions have been advocated from time to time, but with limited success, the two most commonly used to-day being bichloride and iodine.

Dr. McDonald claims his solution will sterilize the hands thoroughly and quickly and without irritation from constant use. These points have not been confirmed in our laboratory investigations.

Dr. McDonald also submits a laboratory report, citing a number of tests of the efficiency of the solution in which the hands were bathed with cultures of staphylococcus aureus and bacillus prodigiosus and then disinfected with the solution.

While staphylococcus aureus is an excellent representative of the common pyogenic organisms and one most frequently met with in skin infections, it is readily killed by the better disinfectant solutions and is not so resistant and hard to reach when poured on the skin as the staphlyococcus albus epidermis, a normal inhabitant of the skin and occasionally the cause of stitch abscess.

The bacillus prodigiosus on the other hand is a typical saprophyte, and, while its presence may be very readily detected, and is, therefore, of value in cultural experimentations, it possesses very little resistance to disinfectants and heat. No reference is made by Dr. McDonald as to the effect of this solution on spore-bearing organisms.

It is the opinion of the authors that, while these tests cited by Dr. McDonald are satisfactory as far as they go, they are not complete and do not give a fair idea of the bactericidal efficiency of the fluid, for the reasons above stated concerning the variations in the resistance in different organisms and even those of the same strain.

In an endeavor to learn further details concerning the efficiency of this solution we outlined a schedule for experimentation, covering the disinfection of the (1) hands, washed and unwashed, and dipped in organisms; (2) skin of the abdomen and other parts, washed and unwashed; (3) sutures passed through the skin and sections of skin variously treated; and (4) sutures soaked in cultures, disinfected and cultured.

In every instance whether the parts were scrubbed beforehand or not, they were exposed to the solution for given periods and afterward washed off in sterile water to prevent any inhibition of cultures and in each and every instance the sterile water was controlled and other controls were made where possible.

Our cultures from the unscrubbed and scrubbed hands and hands immersed in cultures and then exposed to the action of the solution from thirty seconds to one minute were far from satisfactory. Three series having been made from hands not previously contaminated with cultures, gave a result of 2 per cent. positives, exclusive of one positive culture of series three which was probably a contaminant. The greater number of positives were obtained from around the nails. Cultures from hands contaminated with organism and dried on, and then immersed in the solution, gave a percentage of 32 per cent. positives, the spore-bearer (subtilis) was positive in all its cultures. Cultures in all instances were taken by firm scraping from the palms and fingers (see Table I).

TABLE I.—RESULTS IN TESTING GERMICIDAL EFFICIENCY OF McDONALD'S SOLUTION IN DISINFECTING HANDS.

	30 seconds exposure. From palms and fingers. Wet	30 seconds exposure. From palms and fingers. Dry	1 minute exposure. From palms and fingers. Wet	1 minute exposure. From palms and fingers. Dry	1 minute exposure. From palms and fingers. Dry
Unwashed hands —3 series 1st....	–	–	–	–	+ albus
2d..............	–	–	–	–	+ colon
3d.............	–	+ yeast and subtilis	–	–	+ albus
Scrubbed hands...	–	–	–	–	+ albus
Unwashed hands —organisms dried on staph. aureus.	–	–	–	–	–
staph. albus......	–	–	–	–	+ albus
B. coli...........	–	–	–	–	–
B. pyocyaneus....	–	–	–	+ albus pyocyaneus	+ albus
B. subtilis........	+	+	+	+	+ all subtilis

Hands exposed to solution for above periods, rinsed off in sterile water, cultures taken wet and after drying with sterile towel.

+ positive.

– negative.

Cultures from skin of patient, taken from abdomen, arms, and back of neck, showed 33⅓ per cent. positives, the skin having been subjected to sponging with solution in some instances and compresses in others, applied from thirty seconds to ten minutes (see Table II).

TABLE II.—RESULTS IN TESTING GERMICIDAL EFFICIENCY OF McDONALD'S SOLUTION IN DISINFECTING SKIN OF PATIENT.

Areas Taken—Abdomen, arms and back of neck.

	30 seconds sponging	1 minute sponging	2 minutes sponging
Unscrubbed Skin			
Wet 1st.......	–	–	+ albus
2d........	–	–	+ subtilis
Dried with sterile towel.	+	+	+ all albus
Skin scrubbed with soap and water			
Wet..................	–	–	–
Dry..................	–	+	– subtilis and albus
	Compress 1 minute	Compress 2 minutes	Compress 3 minutes
Wet surface............	–	–	–
Dry surface............	2 minutes	5 minutes	10 minute
	+	–	–

Cultures from linen sutures passed through the skin and sections from the skin itself dropped into culture media showed all positives with the exception of one (see Table III).

TABLE III.—RESULTS IN TESTING GERMICIDAL EFFICIENCY OF McDONALD'S SOLUTION IN DISINFECTING SKIN AND SUTURES.

	Skin scrubbed with soap and water and apply compress to wet surface 1 minute	Skin scrubbed with soap and water and apply compress to wet surface 2 minutes	Skin scrubbed with soap and water and apply compress to wet surface 3 minutes
Linen suture passed through skin and cultured.........	+	+	+ albus and subtilis
Section of skin cut off and dropped into culture medium.................	+	+	+ albus
	Dry	Dry	Dry
Linen suture passed through skin and cultured.........	+	+	+ albus
Section of skin cut off and dropped into culture medium.................	+	+	– albus

Unsterilized suture material, linen, silk and catgut with and without dipping in cultures of organisms above mentioned, immersed in solution and rinsed off in sterile water, showed 72.2 per cent. positive cultures, every culture from the catgut being positive (see Table IV).

TABLE IV.—RESULTS IN TESTING GERMICIDAL EFFICIENCY OF McDONALD'S SOLUTION IN DISINFECTING UNSTERILIZED SUTURES AND SUTURES SOAKED IN CULTURES OF ORGANISMS.

All sutures exposed to action of solution for one minute, rinsed off in sterile water and cultured.

	Linen	Silk	Catgut
Unsterilized sutures..........	–	+ subtilis	+ Gram neg. aerobic spore bearing bacillus
Sutures soaked in cultures, dried, exposed, and cultured			
Staph. aureus..............	+	–	+
Staph. albus................	–	+	+
B. coli.....................	–	+	+
B. pyocyaneus..............	+	–	+
B. subtilis..................	+	+	+

CONCLUSIONS.

1. The McDonald solution gave results inferior to the iodine method of preparation in our limited number of cases, one hundred and fifty.
2. The solution is not adapted for the routine sterilization of the hands from its irritating qualities, aside from the question of sterilization.
3. It can be used for mucous membranes.
4. It is slightly cheaper than the iodine solution.
5. Sterilization of the skin is unsatisfactory.
6. It does not destroy spore bearing organisms.

While it is with reluctance that we differ materially with the originator of this germicide in the surgical value of McDonald's solution, we feel that our conclusions are not hastily drawn and submit them for what they are worth. We do not believe it has a place in surgery, possessing no advantages over the present method of skin sterilization which are not more than nullified by glaring disadvantages.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Thirtieth Annual Meeting held at Newark, N. J.

September 17, 18, *and* 19, 1917.

Third Session, September 17, 1917.

The President, John W. Keefe, M. D., *in the Chair.*

Dr. James F. Percy, of Galesburg, Ill., read a paper on

THE END RESULTS OF THE TREATMENT OF INOPERABLE UTERINE CANCER BY HEAT.*

DISCUSSION.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I would like to ask Dr. Percy how he deals with those cases in which the cauliflower excrescence has invaded the upper vaginal zone and the vagina is narrow so as not to admit his water-cooled speculum, and the uterus is fixed so that the normal right angulation of the cavum uteri is maintained with that of the vagina? Or again in those cases in which the speculum because of uterine fixation cannot possibly reveal the cancerous growth. In some cases the cauliflower excrescence is so large that with a small vaginal canal one is unable to deliver in the upper portion of the lumen of the speculum the entire cancerous growth. I would like to ask him what he would do in those cases.

Dr. Gordon K. Dickinson, Jersey City, N. J.—I would like to ask Dr. Percy if his pathologists make microscopic sections after death, and there are deaths, and whether it is the heat that kills the cancer cell or is it the subsequent cicatrization?

Dr. Percy (closing).—In reply to the first question I would say that where the vagina is small and involved in the cancerous process, the vaginal dilator should be used. An objection that has been urged against this instrument is the production of cracks that sometimes appear in the mucous membrane, thus encouraging the disseminations from the cervical growth of the cancerous process by autotransplantation. I am not yet convinced that cancer can be made to grow in this way. Again, if we look for the little shot-like masses that by careful search can often be found under the vaginal mucous membrane, we will in the majority of cases, I believe, find the real explanation of the development of carcinoma after the use of the vaginal dilator. My own practice is to swab out the vagina with iodine or Harrington's solution and then gently dilate the vaginal tube. This canal was intended to be dilated and if it is done in a reasonable way with the dilator, a much better and therefore more effective application of the heat can be made.

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* Original article will be published in January issue.

As to the angulation of the uterus and having a heating iron to fit the varying positions of the uterus, this is not practical as I found when I attempted it. It is exceedingly difficult to get the angle you may want for an individual case. The uterus, on the other hand, is never so firmly fixed that, when the abdomen is opened, it cannot be turned down or brought up in order to straighten the cervical canal. An important additional aid is the making of a crucial incision with the cautery knife through the uterocervical junction in order to facilitate the passing of the heating head to the fundus of the uterus. There is no data on the pathology that Dr. Dickinson asks for. Occasionally I find that some one has reported that they have found under the microscope viable carcinoma cells after the application of the heat. I am very much interested to know how they determine that they are viable. My pathologist Dr. W. H. Holmes and my associate Dr. L. J. Pollock believe that the only way to determine this is to stain the freshly removed coagulated tissue. Heat is one of the best of fixatives and if no other is used and the tissue is frozen, sectioned and stained, then only the cells which have been coagulated by the heat technic will stain. In other words, the dead cells take the stain while the living cells do not take the stain when the tissue is sectioned without fixation.

DR. J. HENRY CARSTENS, of Detroit, Mich., read a paper on

GALL-BLADDER TROUBLES COMPLICATING DISEASES OF THE INTERNAL GENITALIA.*

DR. J. H. BRANHAM, of Baltimore, Md., read a paper on

GALL-BLADDER SURGERY.†

DISCUSSION ON THE PAPERS OF DRS. BRANHAM AND CARSTENS.

DR. HERMAN E. HAYD, Buffalo.—So far as the paper of Dr. Carstens is concerned, there is no question that we should try to make as good a diagnosis as possible. That goes without saying and we must not forget, when we are examining the pelvic organs, there are organs above that may be diseased, consequently we should examine the entire abdominal cavity if the case is not an infectious one. But whether it is wise to combine operations from below with operations above is a question of individual judgment. If the operation that you are going to do below is simple and of short duration, and you are an expeditious operator, probably you can satisfactorily go up above and do whatever surgery you wish on the gall-bladder. As a rule, it is perhaps best to make two operations, and have a living and satisfactory patient than to prolong the operation unnecessarily and have a dead patient.

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*For original article see page 936.

†For original article see page 940.

The paper of Dr. Branham was especially interesting to me, and I am sorry Dr. Porter was unable to read his paper. It is very evident that Dr. Branham has not read Dr. Porter's last paper which was published in the Journal of the American Medical Association. It is a most philosophical presentation of this subject.

Those men who say the gall-bladder has no function have not studied their physiology, because in the gall-bladder the bile gets its glycocholate and taurocholate of soda and its mucin and by these elements its proper alkalinity is established. Such bile does not irritate the pancreatic outlet, it activates the pancreatic secretion. Moreover, the bile from a functionating gall-bladder has twice its power in starch digestion and three times the potency in its fat digestion than bile coming direct from the liver. These things are facts; they are established by the best laboratories in the country and because we can get along without a gall-bladder—because it is not a vital organ, is no reason why we should say it is not a potentially useful organ so far as digestion is concerned. In the second place, if patients from whom we removed the gall-bladder were all well, that would make the proposition a simple one; but the statistics of different operators show that from 20 to 35 per cent. of these cases where the gall-bladder is removed are not well, and why are they not well? Because in a very large percentage of cases gall-stones have been overlooked and if a gall-stone has been overlooked and it is necessary to go in a second time, you have a serious undertaking when you have no gall-bladder to guide you. In the third place, which is the most important of all these propositions, gall-stones are the result of a previous infection, yet in from 53 to 70 per cent. of the cases that have gall-stones the gall-bladder is sterile. Now, if the gall-bladder is sterile, why should we remove it? It is thin, elastic, distensible, it has a smooth peritoneal coat, and it has the possibility of future physiologic function. It is not a pathologic unfit organ.

So far as cures are concerned, cure is a very relative proposition and a very elastic term. Swope out of 2000 cases of cholecystectomy reported about 97 per cent. of cures; other men report about 60 to 70 per cent. of cures. I should like to examine Swope's cases because the personal equation enters so largely into the estimation of cures of any case. Again, if removing the gall-bladder lessened adhesions, which the doctor tries to say it does, that would be a rather strong indication for its removal, but it is not so. Deaver, as a result of his experience, takes the position that when the gall-bladder is removed there are more adhesions than when the gall-bladder is drained and in my cases of cholecystectomy I found dense adhesions in a second operation. Consequently we cannot treat this proposition in the way some of our progressive surgeons are doing. They say that as the result of their experience they are taking out more gall-bladders. I maintain that every gall-bladder should be treated individually, and no man should say that he is taking out more gall-bladders without specifying the kind, because just as soon as he makes that statement, then he is no doubt robbing nature of a very important organ, because if not specially diseased it should not be removed.

So far as the dangers of cholecystectomy are concerned, and this is a practical phase of the subject, it is possible that the Mayos and Erdmann, with their beautiful clinics and splendidly equipped operating rooms, with splendid assistants, with their experienced and skilful anesthetists, they can remove the gall-bladder and not have a greater mortality than you or I do. I am satisfied, however, that if I were to remove all gall-bladders, my mortality would be a great deal larger than it is at present. In a discussion in Buffalo, Crile took the position that the reason why he was removing more gall-bladders than heretofore was because in so many of his cases the wound has broken open a second time; that the gall-bladder had discharged, filled up and discharged again. In that discussion I told him it was not my experience, and that in over 200 cases of gall-bladder trouble for which I had done cholecystostomy, I had only four cases where the gall-bladder ever broke open after the original operation. Now, if I had only four cases in which the wound broke open, I cannot see any object in subjecting patients to the increased risk and to all of the other possibilities of poorer digestion as a result of the removal of the gall-bladder.

Again, Dr. Charles Mayo takes the position when these patients are not cured of their dyspepsias it is because the gall-bladder was not removed. You know, gentlemen, that is about as unscientific a statement as a man can make and I cannot believe Dr. Mayo made it, because we must eliminate the dyspepsias originating from so many other troubles, as retroverted uteri, or chronic appendicitis, or eye troubles or thyroid disease. Any one of these conditions and many others can produce dyspeptic symptoms and therefore we cannot always attribute the continuation of these dyspeptic symptoms to the retention of the gall-bladder. I am satisfied the pendulum is moving now with an increased momentum in the direction of cholecystectomy and it is a question of only a few years when men will come back to the point of removing gall-bladders only when it is absolutely necessary. When you have a shriveled, functionless gall-bladder, where there is no possibility of relieving the symptoms otherwise, it should be removed and yet I have often left such a gall-bladder in a patient and the patient has done remarkably well, but in these cases there is a possibility of cancer developing in that shriveled up organ, which makes it an indication for the removal of the same.

Dr. Albert Goldspohn, Chicago.—I think it is our duty to make as complete a diagnosis as we can before operation and I do not think favorably of the idea of making a diagnosis after we have opened the abdomen because we can see better. That policy results in harm to the patient. I get gynecological patients every now and then that have been to see other men and have had some operation proposed to them in the upper abdomen, either for gall-bladder disease or for ulcer of the stomach, or for ulcer of the duodenum. In most cases the epigastric symptoms disappear after purely pelvic operating, with or without some medical care afterward. I have also known of cases that have been opened for ulcer of the stomach or for some pathology supposed to be there that was not found, in cases that I know had something the matter with them gynecologically. The method I pursue to obtain more information whether there is present, in addition to the gynecological condition, also real pathology in the upper abdomen, is by making use of the principle that I hold that gynecological lesions are eased or relieved along with their referred epigastric symptoms by continued recumbent posture. Every pronounced gynecological case has more or less unpleasantness or dyspepsia or discomfort about the epigastrium. With all due respect to the neurologists, I cannot agree that pelvic lesions have no effect upon other parts of the body and if a given case is a gynecological one with only referred functional disturbances in the epigastrium, this fact will appear from the improvement in the local and referred symptoms after putting the patient completely at rest. Place such doubtful patients, like all acute pelvic cases, in constant recumbency with warm, moist dressings on the abdomen properly insulated, and with suitable diet and attention to the alimentary canal, preferably in a hospital for a week or two. Then you will have more nearly a correct impression as to whether you will find something wrong in the epigastrium, in addition to what you know is present in the pelvis and you can talk to your patient about what you probably want to do, and accomplish it without inflicting nearly so great wear and tear upon the patient surgically.

As to the relative merits of cholecystectomy and cholecystostomy, I have always favored cholecystostomy; and I know of only one single instance years ago where I had to remove a stone secondarily from the gall-bladder that was drained. However, some gall-bladders are too badly disorganized. They may be shriveled up, as we find them with common duct stone or they are greatly thickened, infiltrated and stiff, with inflexible walls. These need to be removed. But other diseased gall-bladders, especially those with stones in them, can be made to return to health by a sufficiently long drainage, provided that we keep the gall-bladder clean during that length of time. You cannot drain any such sinus for any length of time before there will be infection to a greater or less degree from without inward; but in the gall-bladder we can counteract that by washing it out daily, but not with strong antiseptics. I like to use a solution of the volatile oils, such as the oil of cassia or the oil of cloves in particular. They are soluble in warm water in at least one-third of one per cent. Take a saturated solution of boric acid and add to it these volatile oils and you have something that is potent and not toxic. After the first week after operation I like to have about a pint of this solution delivered in the bottom of the gall-bladder daily by irrigation through a small soft rubber catheter within a much larger drainage tube, thus securing a current from within outward. The results are very satisfactory, particularly in cases that have undergone a pelvic operation as well as a cholecystostomy. I could not have done a cholecystectomy with equal satisfaction to the patient and myself.

Dr. John W. Keefe, Providence, R. I.—It seems to me this matter of gall-bladder surgery is not settled, even to-day. When doctors attend some of the famous clinics and see dexterous men operate, they go home and say that the Mayos are taking out all of their gall-bladders now, and proceed to do likewise, which is attended with a frightful mortality in consequence thereof. The average surgeon after removal of the gall-bladder will have dead where he would have live patients by opening the gall-bladder and draining. There is a very large percentage of cures brought about by drainage of the gall-bladder, and any surgeon is able to drain the gall-bladder. It is said, if we find a thickened gall-bladder, one that is one-eighth of an inch thick, it should be taken out, but I have seen patients get well and remain well just by drainage alone. I heard Dr. Finney, of Baltimore, speak on this subject about one year ago. He said, "I concluded I would take out most of these gall-bladders, but now I have four cases in the hospital that have biliary fistulæ, and I do not know what to do with them. I am worried to death about them." All cases in which the gall-bladder is removed are not followed by cure. There is a marked morbidity following the operation and the formation of adhesions following cholecystectomy. Only last week I removed a gall-bladder from a patient, although two months ago a Roentgenologist told me there were three stones present. I looked at the plates myself and I thought the shadows were stones. He pointed out a little ring and a dark center and said that nothing could give one that shadow except a gall-stone. He stated it could not be a stone in the kidney. I operated, and there was not a single stone found in the gall-bladder.

I had occasion to reopen a case in which I had removed the gall-bladder, and found the gastrohepatic omentum adherent; then I found the stomach and pylorus in the first part of the duodenum adherent over the site where the gall-bladder was. That was one of the most trying cases I have ever had in gall-bladder surgery, and I do not know that I have done the patient any good with a secondary operation.

In another instance recently a doctor in the south had removed a gall-bladder. He removed it a year ago this month, and the patient has had a biliary fistula more or less since then, the fistula occasionally closing, then reopening. I concluded that probably the patient had a stone in the common duct. I reoperated, found plenty of adhesions, and removed a stone near the ampulla of Vater.

We may remove all stones we can feel in the common duct or the gall-bladder and yet there may be stones up in the liver. I recall one case in which at autopsy there were a thousand stones found in the ducts and in the liver itself. The removal simply of the gall-bladder would not have cured that case.

I feel very definitely that the average surgeon in this country should just cut into the gall-bladder, insert a little tube, and drain it. The experts can take out more gall-bladders and, very likely will, than the average surgeon, but I do think that even the experts will find considerable morbidity following cholecystectomy.

Dr. John Norval Bell, Detroit.—There is one factor in connection with these gall-bladder cases which may have something to do with the determination of the advisability of cholecystostomy or cholecystectomy, and that is the question of whether or not the infectious material is all done away with after prolonged drainage. Most surgeons have had the experience of having performed cholecystotomy on a case, with drainage going on for a certain number of weeks or more, and then the wound closed up, but later on the patient developing a fresh attack of cholecystitis. A pathologist in our institution told me that in some cases of that nature he had found the gall-bladder had drained long enough so that the secretions were sterile, but on subsequent removal of the gall-bladder, after making sections, small stones were found in the gall-bladder wall, also, there were isolated streptococci scattered throughout the wall. That may have a bearing on these recurrences we encounter now and then.

Dr. Thomas B. Noble, Indianapolis.—The advice to close the abdomen after cholecystectomy without drainage is absolutely wrong. No man can tie a ligature about the neck or stump of the cystic duct and know that it is secure, so that instead of adopting the rule of closure without drainage, make it a rule to drain, and many of your cases will get well that would not otherwise get well. I have seen patients die that were undrained, who would have gotten well if they were drained.

Dr. Carstens (closing on his part).—In my paper I simply made a plea for doing more operations, if possible, at one sitting. I have had these cases in association with abdominal hysterectomy, and one can do an abdominal hysterectomy and without much trouble, remove gall-stones at the same time, instead of subjecting the patient to a subsequent operation.

As far as the paper on cholecystectomy is concerned, I did not say anything about the operative technic. We have to judge each case by itself in regard to whether it should be subjected to cholecystectomy or not. I think Dr. Hayd hit the nail on the head, still I want to go a little further. I drain the gall-bladder, especially if there is septic material in it. I drain the gall-bladder also because I think there may be some stones left in there, and in the course of a week or so they come out and no stones are left, and that makes me feel safe. I believe cholecystectomy is a more difficult operation than cholecystostomy, and rarely do I perform it, although once in a while I believe it should be done. But the cases must be individualized. I want to make the point that some of these gall-bladders ought not to be drained. Some fifteen or twenty years ago I had a controversy with the late Maurice Richardson of Boston. He claimed that all gall-bladders containing gall-stones were infected. That statement surprised me, so I went home and every gall-bladder I operated on afterward was examined carefully, and I could not find an infected gall-bladder except here and there in an acute case that I had diagnosticated. I made up my mind that it was wrong to say that all gall-bladders containing stones were infected. All of them are not necessarily infected, although some of them may be on account of the inflammation and irritation caused by the gall-stones. I found out also that when a gall-bladder contained one stone of the so-called mulberry variety, in trying to expel that stone the gall-bladder wall would thicken, its muscles being put in action like those of a blacksmith who uses a hammer. That gall-bladder was not infected, it had thick walls because it was working hard to squeeze out that stone and could not do it. When I opened the gall-bladder, out popped the stone. I carefully sewed up the wound with a double row of Lembert sutures, dropped the gall-bladder back and closed without drainage. I have had quite a number of cases treated in that way. I think it is an ideal method of dealing with these cases, but I would not advise it always.

Dr. Branham (closing).—I am afraid I did not make myself quite as clear as I should have done. Dr. Hayd seems to have gotten a very wrong impression of what I said. I judge from his remarks that he thought I was advising the taking out of all gall-bladders whether diseased or healthy, but I did not advise that. I do advise the taking out of all diseased gall-bladders, and I think a greater proportion of cases with suitable drainage would be cured without any operation. In spite of the unfavorable criticism, I feel I can stick to my guns about the removal of the gall-bladder, and also about closing the abdomen after the removal of the gall-bladder. When I read a paper on this subject in 1913, the Mayos were very strongly against cholecystectomy and advised it in very rare instances, so the fact that they are now changing their opinion and are advising cholecystectomy in markedly diseased gall-bladders, is no reason why I have advised it here. I advised it before they did. I have not had a large experience; but I have taken out quite a number of gall-bladders, have not had any mortality from this procedure. I have had a number of deaths from drainage of the gall-bladder. That occurs practically always in operating on desperate cases, when patients are too sick to take out their gall-bladders and almost too sick to drain them.

The removal of the gall-bladder is not a dangerous operation. It can be done by any surgeon who has practised it and knows his anatomy thoroughly. I do not think it is as dangerous an operation as drainage of the same kind of gall-bladder would be. That looks to me like common sense, because if you take out a diseased organ which is always a source of danger, you get rid of that infectious diseased organ which is utterly incapable of being cured or restored by drainage, and your patient has not that additional danger to fight.

So far as the function of the gall-bladder is concerned, I have great admiration for Dr. Porter, but I cannot agree with what Dr. Hayd has said. I think the function of the gall-bladder in digestion is about as imaginary a thing as anybody could talk about. I have never heard any one talk about its having the function of digestion before. Bile has nothing to do with digestion, no matter where it comes from and to say that one-twentieth of the bile going into a little reservoir can have some bearing on the influence of digestion is absurd.

I do not think we ought to close the abdomen when we take out the gall-bladder unless we are perfectly certain that the gall-duct and cystic duct are tied off securely and closed over with peritoneum from top to bottom, so that we have nothing but a smooth surface where we cannot have any adhesions. If you take out an acutely inflamed gall-bladder and put in drainage, the probabilities are you are going to have more or less adhesion; but if you make your dissection carefully and leave plenty of peritoneal surface to cover all raw surfaces, you will not have many adhesions if you take out the gall-bladder. I want to say contrary to Dr. Hayd's opinion, that a diseased, badly damaged gall-bladder, should be removed. I do not advise taking out healthy gall-bladders, but diseased gall-bladders are going to be taken out more and more as time goes on because you will thus get rid of the diseased organ.

Dr. D. H. Stewart, of New York, read a paper on

THE LEFT FALLOPIAN TUBE AND INTESTINAL STASIS.*

Dr. Thomas B. Noble, of Indianapolis, Ind., read a paper on

GIANT COLON TREATED BY COLONECTOMY.†

DISCUSSION.

Dr. Joseph H. Branham, Baltimore.—This is certainly a very remarkable and interesting paper, and something ought to be said in the way of commendation. I think the operative procedure which Dr. Noble has advocated is a decided improvement over the Lane method.

I would like to know what the mortality was in these twenty-nine cases, if he had any?

Dr. Van Amber Brown, Detroit.—I have seen Dr. Noble do this operation, and I have seen Mr. Lane do it a good many times, but Dr. Noble's way of doing it is simplicity itself as compared with the work done by Mr. Lane.

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*For original article see page 943.

†For original article see page 946.

Dr. Noble (closing).—The twenty-nine cases that I referred to cover the records of four years. The type of operation I have done has been partial colonectomy for carcinoma at the head of the colon, with removal of several inches of the terminal ileum, the appendix, the ascending and transverse colon, with its subjoined mesentery, and the mesenteric lymphatics. I find that of nineteen cases, in ten none of them died after the operation, but two of them have died since. There are eight patients living who were operated over two years ago. Of the cases in which the entire colon was removed, three have died. I lost one of them by an accident, having used a catgut ligature around the lower end of the sigmoid when I ligated the gut previous to cutting it away. My assistant picked up the end of the gut and the catgut simply rolled off and permitted highly infectious material from the sigmoid to enter the abdomen. The patient died promptly from peritonitis. Silk, as I have said in the report of my cases, is free from this danger. It will go down through the smooth wall of the large intestine and stay fixed; it will not roll off the end of the bowel. You can trim down that portion of the gut distal to the ligature with the cautery or scissors or with what you choose to use and make the inversion of the stump much easier without the danger of having the ligature slip off.

I cannot give you the number of colonectomies I have done, but I have lost, as I have previously said, three cases in which the colon was removed in its entirety. One was a case in which there was inanition, long continued intoxication, a condition of acidosis, wild delirium and a maniacal state for ten days following the operation and final dissolution.

Fourth Session, September 18, 1917.

The President, John W. Keefe, M. D., *in the Chair.*

Dr. W. A. B. Sellman, of Baltimore, read a paper on

TREATMENT OF APPENDICULAR ABSCESS.*

Dr. Julius H. Jacobson, of Toledo, Ohio, read a paper on

LEFT-SIDED APPENDICITIS IN SITUS INVERSUS VISCERUM TOTALIS.†

DISCUSSION ON THE PAPERS OF DRS. SELLMAN AND JACOBSON.

Dr. Robert T. Morris, New York.—When I was full of enthusiasm and energy I used to distinguish between two kinds of appendicitis. First, irritative lesions of the appendix which do not go on to suppuration. Second, infective lesions which produce adhesions. When I was full of enthusiasm and energy I used to separate these adhesions and make earnest efforts to remove the appendix.

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* For original article see page 950.

†For original article see page 953.

I did a lot of work for my patients that I would not now do. I have begun to take things in life easier and incidentally I find that operative work is included. This makes things more comfortable for my patients as they get well better than they did in my days of youthful vigor.

My idea in not walling off the appendix with gauze depends upon the fact that most of this pus is sterile. It is an albuminous fluid, and if you should leave a little of it in the peritoneal cavity it may help to nourish the patient. Don't bother to wall off the pus with gauze; take out the major part of it. The bacteria are at work in the tissues, not in the pus. If you should spread the pus over the peritoneum it will do less harm than would be done by walling, wiping and flushing. That severe work belongs to the pathologic era of surgery where we think we must do the work of nature ourselves; but now, when we have advanced to the physiologic era we should turn the patient over to himself. When a doctor washes the peritoneum and does all this elaborate work he is usurping the function of the Lord and the patient. Don't do it. Turn the patient over to himself and give him home rule. That is the trick. If you find it is going to cost the patient a good deal to get the appendix out, not financially, but in relation to his general condition, don't do it. Open the abscess and establish drainage quickly, then stop. The modern idea is to get in and get out as quickly as you can. If the appendix makes trouble subsequently, step in and make trouble for the patient again. The method will work out better than that as a rule. You can always tell if an appendix that is left in is making trouble by two signs; the right sympathetic lumbar ganglion is hypersensitive on pressure. When it is hypersensitive alone the appendix is making trouble. The next sign is distention of the ascending colon due to tiring out of the muscularis. By these two signs you can tell whether it is making trouble or not.

With regard to leaving forceps on a stump instead of ligating the same, I do that in some cases to save time. Take the forceps off the next day. It is less trouble than to ligate. You can do the forceps trick in one minute. Instead of getting head over heels in the abdomen, look in and see where the stump of the appendix is, snap on the forceps and take them off the next day. A fecal fistula will not often form and when it does it will close spontaneously.

So far as the artery is concerned, you do not need to ligate it very often, because endarteritis has, for the most part, disposed of the same.

I do not depend upon a wick drain in all cases; I suck out the fluid by introducing an additional fluff of gauze at times. I have not used adventitious drains for years. (Here Dr. Morris explained and demonstrated on the blackboard the technic of his method of dealing with the appendix.)

Dr. Gordon K. Dickinson, Jersey City, N. J.—It takes temerity to follow Dr. Morris. I did not hear Dr. Jacobson's paper much as I wanted to. But with reference to the first paper by Dr. Sellman, if you will take the most excellent work of Lockwood, of London, on appendicitis, you will find that he makes sections for the microscopist and reports on every case. He looks upon many of these cases of appendicitis as being due to lymphangitis and that the first abscess points. The first place where you have evidence of infection outside of the lymph stream is at the mesentery. That is where the parts are weak. The abscesses are prone to grow, yet you will find the appendix has healed over and is absolutely normal except in a section. Hutchinson has written an excellent work on the anatomy of the peritoneum in which he shows that the artery that goes to the base of the appendix frequently supplies the cecum, and most any of the pathology which exists around and in the base of the appendix also exists in the cecum. For the last five or six years I have removed the tip of the cecum with the appendix for the same reason that you do not amputate a diseased tube and leave the infected stump to go into the fundus of the uterus; therefore you should resect a portion of the cecum.

I do not believe we should drain. The omentum drains. The peritoneum may play a part in some drainage, but the surgeon does not drain. You put in a plug, you make a path of least resistance for pus and serum to come out later. You produce irritation which brings out lymph and walls off. You dam the process, but you do not drain it.

Dr. J. Henry Carstens, Detroit.—I think Dr. Morris has cleared up the whole thing when he says that we always try to do too much. That is the great trouble. We go too far inward in opening the abdomen in these appendicular abscesses, instead of going away over on the side. A great many of these appendicular abscesses are postcecal. The appendix points upward and is back of the cecum, and all we have to do is to go in from the outside, dig down, separate the muscles in different directions, making a small incision, finally strike the abscess cavity, and the operation is finished in about five minutes. Then you insert a little rubber drainage tube. We should not insert the gauze type of rubber drainage tube because gauze plugs up. It does not drain more than twelve hours. The capillarity ceases because it is filled and you have to pull the gauze out. This hurts because the gauze is adherent. I insert a small rubber tube one-third of an inch thick and I do not use any stitches. Sometimes I put in silkworm-gut stitches on each side of the tube and make an incision one and a half to three-quarters of an inch long, and that is all. I let it alone and nature will do the rest. Some operators make an incision pretty nearly in the middle of the abdomen, get into the abdominal cavity, cut the peritoneum in front and behind, in order to get into the pus sac, and many of their patients have septic peritonitis and die. If the operation is done the other way, very few of them die and in very few cases will the appendix cause any trouble in the future. If you can remove the appendix, tie it off; if you cannot tie it off, cut it off. If there is any hemorrhage, put on a clamp, but as a general rule you do not need to do anything but trust to the *vis medicatrix naturæ.* Nature knows a good deal more than most of us.

DR. CHARLES L. BONIFIELD, Cincinnati.—A few years ago we all talked about draining and leaving the appendix alone, later we talked about getting the appendix out in every instance, and now we are talking about draining again. Personally, I think Dr. Morris and Dr. Carstens have regarded the matter in too broad a way. When they say very few appendices give trouble afterward and their patients remain well, I must answer that their experience has been different from mine. Their patients do not always come back to them but go to somebody else and get their appendices taken out. I have had that happen dozens of times. When I take out the appendix I find my patients get well and that satisfies me. I remember one case in particular in Indiana some years ago, on which the late Dr. Reamy operated when I was his assistant. He simply cut in and evacuated the abscess. A year later there was just as big an abscess as before. I took out the appendix. In the meantime, the patient took up Christian Science and said the Lord had cured him.

DR. ALBERT GOLDSPOHN, Chicago.—Regarding the anomalous position of the appendix, I have had this experience: in two instances I had to search up to the region of the hepatic flexure of the colon to get the appendix out, and in a case I operated on about a week ago I had to go about half that far and take out an appendix 7 inches long that was wholly retrocecal, a rather difficult thing to do.

As to the technic of operating for the removal of the appendix; I think that the mode of approaching it varies with the pathology. The ordinary chronic or interval type of appendix is a very simple affair and we ought to be able to take it out through an opening in the abdominal wall that is cut only through the skin and superficial fascia and stretched large enough through the muscles to do the work there after the McBurney technic.

In acute cases usually of two or four days' standing, with an appendix gangrenous or nearly so, with peritonitis or a purulent exudate not diffusely disseminated, I make a generous incision preferably through the right rectus, drain generously with small gauze ropes placed one into the pelvis, one into the loin and one or more toward the median line as may be needed. These are not wholly covered by rubber tissue and the wound is sutured very little so as to afford the best possible drainage. Proper closure of the wound is made later when life is no longer in danger. In a case similarly or further advanced and with a rather general peritonitis present, I make, in addition to the incision last mentioned, a small one on the left side and place a rubber tube through both openings down into the true pelvis, supplemented for about forty-eight hours by gauze drains in or about the tubes. The patient is put in a moderate Fowler position. For cases with a circumscribed abscess, I make an incision as if for ligating the external iliac artery and proceed extraperitoneally, lifting the parietal peritoneum until it breaks usually at a friable spot nearest the abscess, which is then entered and drained largely by gravity without free peritoneal surfaces coming into view or contact. In these cases likewise, I have nearly always been able to find the appendix or remnants of it upon the abscess wall and have removed it without breaking down the latter. The after-treatment in these cases was usually very gratifying, particularly as compared with the waiting and fasting treatment, which generally means a secondary operation. As for amputation of the simple or chronic appendix without an infiltrated friable wall, I contend that it should be done without using any chemical antiseptic. I squeeze out the mucosa from the segment of appendix in which the amputation is to be made. The stump then embraces only the muscular and serous coats and can safely be buried without antiseptic treatment. Chemical antiseptics reduce the ability of the treated tissues to overcome the germs that are not and cannot be claimed to be killed by any such chemical cauterization. In cases where infiltration of the appendix walls makes this technic inadvisable, the Paquelin cautery is the correct thing to use.

DR. JOSEPH H. BRANHAM, Baltimore.—I agree with Dr. Bonifield that we should remove the appendix if we can do it without considerable damage to the wall of the cavity. It is not a good idea to leave an appendix and depend upon nature to take care of it afterward.

Taking out the gall-bladder without drainage is a point that Dr. Morris touched on. I heard Dr. Finney read his paper when he described an operation of this kind; that he waited for a long time for a suitable case. Thereafter it was done by a great many surgeons, and the cases were successful at the time they were reported. If, after tying the cystic duct, it opens in 10 per cent. of the cases, it is because it has not been tied off properly. After you have dissected out the cystic duct and the gall-bladder, and get the duct thoroughly out in the peritoneal cavity, then crush it as you would an appendix. You must crush it thoroughly so as to destroy everything except the muscular layer. If you tie it off carefully and cover it with peritoneum, it will not reopen unless there is some diseased condition in the other duct that obstructs the flow of bile and forces it back. If you look carefully for a diseased condition which will make such pressure on the bile duct, you will not have it open. A great many surgeons have done this operation for a longer time than I have, and I have not heard of any who had a reopening of the duct where the operation was done in suitable cases.

DR. SELLMAN (closing the discussion on his part).—In regard to the claim of Dr. Carstens that most of the abscesses occur in the mesentery rather than in the appendix itself or other tissues, that is true, because we are unable to find the mesentery in these bad cases when we operate.

In regard to the use of rubber drainage tubes, I think it is a very important question for us to decide if possible, whether it is better to use rubber drainage or gauze and rubber tissue. Dr. Carstens claims that he does not like the contact of the tissues with the gauze. All my drainage gauze I surround with rubber tissue; I make a rubber drainage tube and I dwelt especially on rubber tissue wrapped around the gauze. I am as much opposed to the presence of gauze in contact with healthy tissue as any one else. We are likely to carry infection; we not infrequently infect healthy tissue by the use of drains, but with a cigarette drain, wrapped with rubber tissue, I have not seen infection.

The number of drains are a matter of individual judgment. I was brought up under one of the nestors of the profession, Dr. N. R. Smith, who achieved wonderful results in his time without any antiseptics or anything of the kind. I traveled over the country with him for a number of years and his results without antiseptics were wonderful, and he opened freely and drained. In the early days we used glass drain tubes, which I never use now, and I consider iodoform gauze, not too strong (10 per cent.), a very much more efficient means of draining these cases than the rubber drainage tube which becomes choked. What do we do with a rubber drainage tube before we introduce it? We cut small holes in it and very often these holes act as points of outlet for pus in portions of the drainage tract that were not infected. With a cigarette drain of gauze, wrapped with rubber tissue, none of these little holes are present and allow purulent material to come in contact with healthy tissue.

In regard to cutting off the appendix, I agree with the gentlemen who have discussed the paper, that the cautery is far superior to the knife and I have always been a little uncertain about introducing chemical caustics into the abdomen. But I do not consider that I introduce them into the abdomen; I simply touch the end of the appendix that is cut, the part that is projecting into the bowel, and the bowel will take care of any septic material at the end of the stump. I have often inverted the appendix, without tying, but I have always been uncertain about it.

Dr. Jacobson (closing the discussion).—I was much interested to know whether other members of the Association had had any experience with cases of left-sided appendicitis, or of transposition of the viscera.

Regarding some of the questions brought up in the discussion relative to the opening up of the cystic duct, it is one of the problems that was taken up in my paper. We do know that we open the cystic duct more frequently than is supposed and the percentage is larger than what Dr. Morris has stated here to-day, that is, 10 per cent. In these cases we also ligate by first crushing and using chromicized catgut in various ligatures to prevent the duct from opening. Personally, I do not know why some of them open up and why some do not.

Cholecystectomy should not be done without a drain being placed somewhere near the cystic duct to take care of this kind of complication should it arise.

With reference to the method of ligating the appendix and inverting the stump, I feel that any method which simply ligates the base of the appendix would be unsafe and should not be continued. I am certain that in some of these cases it happens that the ligature does not fit the thickness of the appendix and eventually cuts through, and in some instances peritonitis and death have resulted from this simple ligation of the appendix. It has been my practice for several years not only to put one purse-string but two, which I regard as a safe procedure to follow.

Regarding the treatment of cases of general sepsis and purulent peritonitis, it seems to me one thing should be used which has not been mentioned here to-day, and that is a good vacuum apparatus or suction pump. Since we have installed this as a regular routine in cases of acute perforation of the abdominal cavity, we can without any additional manipulation pass a suction tube into the pelvis and get a large quantity of pus which otherwise goes into the abdominal cavity, and have improved the results very much in these cases.

I also want to speak regarding the method advocated by Dr. Goldspohn, and that is, the extraperitoneal method of opening up the appendicular abscess, or, as he puts it, through the same incision as for ligating the internal iliac vessel. I am sure that is a good procedure, one that can easily be carried out and will do away with the expectant treatment, such as Ochsner has given us and shorten the convalescence and save many patients a good deal of suffering.

Dr. Samuel W. Bandler, of New York, read a paper on

THE DUCTLESS GLANDS IN OBSTETRICS AND GYNECOLOGY.*

Dr. Bandler approached his subject from the therapeutic viewpoint—the indications for ductless-gland therapy and his method of filling them. A gland in nature may underact primarily or be inhibited by the over- or underactivity of another gland. It is in primary underfunction that we obtain ideal results from gland extracts (thyroid, ovary). Hyposecretion of the thyroid is the condition most readily overcome at all periods of life when the extract is given early enough and long enough. The author "has brought peace of mind, sanity and renewed physical vigor to many a depressed, melancholy and prematurely aged woman by the persistent use of thyroid extract." He has also "restored menstruation, overcome sterility and prevented repeated abortion" by its use. Compared with thyroid, ovarian extract has a very narrow field, and besides, its action is inconstant. Of many other gland extracts it can only be said in this connection that they do not influence menstruation. Ovarian extract contains nearly everything that is necessary for the stimulation of menstruation and with luteum substance is often valuable in the prevention and diminution of hot flashes. There are cases in which neither thyroid or ovarian substance or corpus luteum are efficacious and these probably represent pluriglandular insufficiency. After operative climacteric, however induced, ovarian and luteum substances should be given persistently to avoid the onset of hot flashes. The vast majority of patients will be benefited and many cured. In primary ovarian underfunction—as in lactation atrophy—ovarian extract will not only stimulate the ovary but supply a substance necessary to the organism. As a result menstruation is often quickly reëstablished. While pituitrin is hardly able to influence menstruation alone, the addition of this substance to thyroid and ovarian extracts is often of value in relative amenorrhea, late menstruation and extremely scanty menstruation. If ovarian underfunction is the result of the inhibiting action of another gland or glands the results are less favorable and the problem becomes very complex. Obesity may respond favorably to small doses of thyroid or the latter may cause only depression and headache. When obesity is associated with lessened menstruation and sterility, especially in dystrophia adiposis genitalis, the three extracts (thyroid, ovarian pituitary) are given *per os* and if necessary luteum substance and pituitrin are injected hypodermically for weeks at a time. A permanent glass stem pessary should be worn at the same time. By this means it is much easier to restore menstruation than to overcome sterility, probably because of the presence of defective ovulation. It may be necessary in refractory cases to open the abdomen, split the ovary and remove all retained corpora lutea and atresic follicles, afterward carefully sewing up the ovary. The author has had several remarkable results from this procedure.

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*This paper will appear in full in the bound volume of Transactions.

Allusion is made to nervous attacks in women due in part to temporary anomalies of ductless-gland activity. Gland extracts in such cases often possess diagnostic value. In regard to therapy these extracts should be associated with nervous sedatives and hypnotics.

In diagnosis, hypodermics—say of adrenalin and pituitrin—may work in both directions, since they may aggravate or relieve certain symptoms. By the mouth a little thyroid extract will quickly discover hyperthyroidism. Thus far not much has been said of suprarenal extract. Whenever asthenia is in evidence the latter and adrenalin with or without pituitrin, should be given along with tonics (arsenic, iron). This combined method of treatment is often of great value after childbirth for it often greatly shortens the interval required for certain women to regain complete equilibrium. During gestation there is marked antagonism be tween the placental hormone and the ductless-gland secretions so that after delivery the hormone balance is apt to be upset.

In menorrhagia and metrorrhagia the author mentions mammary extract and thymus extract favorably but does not forego the use of ergotine and stypticine nor does he claim results in cases due to fibroids and endometritis. Thymus substance is recommended alike in certain climacteric hemorrhages; menorrhagia in young, single girls, and simple metrorrhagia. Mammary extract is mentioned only in the latter condition. The author does not give it a status in the treatment of fibroids, despite enthusiastic claims, because of the great value of *x*-ray treatment, to which it may be added if desired. As a matter of fact he is practically committed to the surgical management of this condition.

The use of pituitrin in obstetrics may be passed by, for like the majority the author uses it almost without reservation, save that he prefers ergot preparations after delivery. He is an adherent of the early use of pituitrin in all multigravidæ several days before the expected delivery, and it is only rarely that labor does not set in within twenty-four hours. Quinine is used as a synergist. Placental extract (also given hypodermically) cannot determine labor but this is the best remedy he has yet found for dysmenorrhea as far as relieving the pain is concerned; although its action is neither constant or curative. It is possible that placental substance can force the growth of an undeveloped uterus but minor surgical procedures are much superior. There is possibly antagonism between placenta and hypophysis extracts, and the former may prove to be of value in hyperpituitarism.

DR. HERMAN E. HAYD, Buffalo, read a paper on

THYROID EXTRACT IN GYNECOLOGY.*

DR. JAMES E. KING, Buffalo, read a paper on

A CONSIDERATION OF THE INTERRELATIONSHIP OF THE FEMALE SEX GLANDS AND HYPOPHYSIS.†

DISCUSSION ON THE PAPERS OF DRS. BANDLER, HAYD AND KING.

DR. G. VAN AMBER BROWN, Detroit.—What I want to speak of comes within the scope, more particularly, of Dr. Bandler's paper, the bleeding from the uterus in young women. Correction of this hemorrhage is frequently sought by the use of the curet. With the employment of this instrument we get symptomatic improvement, only to have the bleeding recur in a short time, the origin of the disease is not in the uterus but in the adnexa.

We have, physiologically, an infantile ovary and as a result we have bleeding. The condition is spoken of as glandular endometritis, but more properly as metropathia hemorrhagica. These cases can be cured by the use of ovarian extracts or corpus luteum.

DR. J. HENRY CARSTENS, Detroit.—I think there is no doubt that there are cases of hemorrhage from the uterus that can be cured absolutely and perfectly by curetment, and there are other hemorrhages that are due to pelvic disease. It is simply a question of diagnosis. In the future, as we come to understand more clearly the moot questions in reference to the ductless glands, we are going to get marvelous results by treatment with the use of the various extracts and active principles of the ductless glands, and it is up to us right now to clear up all these moot questions so far as possible.

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* For original article see page 958.

† For original article see page 964.

DR. JAMES F. PERCY, Galesburg, Illinois.—It is to be regretted that it is necessary to use glandular extracts purely from the empirical side, as was pointed out in the papers which we have heard this morning.

In 1912 I took up the matter of the influence upon the new-born child of the different glands belonging to the chromophin system with two of the best-known physiologists and embryologists in this country. They told me that there had been no work of this kind done, and there was not any literature to be found anywhere that would help me except isolated papers. One of the things that I regret is that in these papers that have stimulated us so thoroughly, there has been absolutely nothing said about my work in the use of the thyroid gland in nephritis, which I think is the most important phase of the use of thyroid extract that has been given to the profession, because you can take a woman who is a nephritic and feed her thyroid gland and she will go through with her pregnancy safely and apparently without danger. This is a broad statement to make and will probably need revision as greater experience comes, but that is my experience so far.

Recently I had as a patient a woman who was a pronounced nephritic. She was the mother of only one child and had this nephritis with the first child. Her urine was loaded with albumin and casts; she presented herself two months' pregnant, and I knew of her nephritic condition and advised that she miscarry and she absolutely refused. She said she would rather die than lose the child. I kept her on the thyroid extract up to the point of its physiological action and the most useful symptom to me is to find a tremor with the extended arm and hand and the fingers separated. As was said by the essayists, some of these cases will not tolerate the thyroid extract, but I have found very few of that kind. They sometimes become depressed and suffer from dyspnea, but if you cut down the dose you can get along with them. What I have said holds true in the nephritics not only in pregnancy, but in the average case that you see. This, of course, is a pronounced case, but I have a lot of patients who apparently are absolutely well, who have gotten rid of casts and albumin in the urine, who have gotten rid of all the symptoms of nephritis after a course of the thyroid extract. I am speaking now of advanced cases. I recall one man who was waterlogged, he had enormous legs and thighs, edema of the face and hands, and could not lie down. His neighbors stood by him during the night while he slept with his hands over a high-top desk. When they thought he was going to fall they would wake him up. That man in ten days was lying down and slept like a baby following the use of thyroid extract.

In my first paper in 1912 I reported having treated thirty-five cases. I was in the same position as Dr. Ferguson, of Chicago. I heard Dr. Ferguson say that he had had thirty-five cases of hypertrophy of the prostate, and in every one the patients had gotten along well, with no annoyance or trouble after the operation. He went around with his chest inflated and intimated that the other fellow should have the same results. Then, he said, the next four cases he had all went wrong. Every one of them leaked and had no control over the bladder. That is true of my thyroid experience. I give the thyroid extract up to the point of physiological tolerance; as much as 50 grains of the dried gland in a day I usually use a dose of 2 grains which represent 10 grains of the fresh gland. It is marvelous how some of them will tolerate this drug. It may be, as suggested here that some of this thyroid is not active, but that there are other substances in it. Usually the cases clear up in six weeks, if they do so at all. They should be put to bed rather than allowed to be up and around.

In reference to the simple pituitary cases, they are exceedingly common and are frequently overlooked. Last year I reported to the Illinois State Medical Society eight cases of hypopituitarism in young girls and strangely enough four of them were the daughters of physicians. The physical characteristics of these patients were not pointed out by the essayists, if I understood them correctly. These patients are usually fat girls, and you cannot get them thin by dieting as a rule. One of the supreme characteristics of these cases is that the fat is hard; they all have beautiful hands, with tapering fingers, and as pointed out by one of the essayists, they have a sugar tolerance that is quite characteristic. These patients do remarkably well on thyroid and present one of the chief indications for its use.

We can talk about the thyroid in an empirical way at great length, but as to patients with these two conditions I have mentioned, nephritis and hypopituitarism, I have done various things for them without any results, and they have been greatly benefited by the thyroid extract. I believe this marvelous drug, when we learn its full indications, will be one of the most potent and useful remedies in our armamentarium.

Dr. James E. Davis, Detroit.—There is a close correspondence between the present state of our knowledge on metabolism and the pharmacology of these extracts of the internal glands. I do not know of any field that offers more for the patient worker than that of either metabolism or the pharmacology of the glands of internal secretion. The applications that have been made here to-day are indeed suggestive and stimulating. When we think of the metabolism of the critical physiological periods of life, we can easily recall many of our clinical problems.

The period of puberty has been referred to and I think all of us have been guilty at times of endeavoring to correct some error in the metabolism occurring at this time by surgical means when we should have resorted to some of the means suggested in the papers. The same is true of the period of pregnancy and the period of the menopause. Considerable work has been done upon the metabolism of early pregnancy. During the first three or four months there is a negative nitrogen balance; the pregnant woman later on comes to have a positive nitrogen balance. During the first four months we have the clinical evidences of a negative nitrogen balance as shown by many well-known symptoms, such as hyperemesis gravidarum, or others associated with this period, when there is a close contact between the embryo and the maternal organism. It seems during the period of placentation the mother is striving to contend with an invader or an enemy and some mothers are not able to contend successfully with this attack. The best explanation perhaps for this condition is, that in the chorion there is secreted a substance which causes a solution of the mucous membrane of the maternal organism and threatens to destroy a part of the same. Evidence of this is the marked edema and the other conditions that are so well known during this period. The oft repeated bit of history we all have obtained is, that after a woman has borne a child she has not been well since the birth of this child and we endeavor to reckon with that condition by our surgical measures. I believe that very frequently we have to deal with a problem in metabolism. The same is true in oft repeated abortions. Here investigation is needed in the problems of metabolism or the interaction of the secretions of the internal glands. I want to suggest that much useful information can often be obtained in these cases by having an *x*-ray made of the sella tursica. A number of Röntgenologists have shown deviations in the anatomical form of this structure and with the other information we may gain by close study of these cases, we can hereby advance our knowledge and improve our armamentarium.

Dr. Hugo O. Pantzer, Indianapolis.—For the last two years I have resorted to organotherapy in but very few instances. This is because I felt I had not the specific information to guide me in the selection of the special extract to be used in the individual case. This morning I have been guided in a way that will be helpful to me. In the meantime, during these two years, I have sought to define another etiological factor which is active in these cases. I have reference to a toxemia that comes not *per se* from hypo- or hyperactivity of these glands, but from extraneous sources.

The disturbances of function in all glandular structures incident infections of the mouth and throat are noteworthy. The ovarian, to uterine, mammary glands, and the other organs of internal secretion, are all influenced in their function by these infections. In many instances active eliminating measures in these cases have alone sufficed, without resort to organotherapy to correct the disturbances of function of such organs as here have been mentioned. I wish to emphasize this point.

Dr. E. Gustav Zinke, Cincinnati.—When I studied embryology, from books alone and without the aid of a teacher, I often wondered how the authors knew that what they said was true. In order to grasp the subject at all, I was obliged to commit what I had read to memory and then, parrot-like, repeat it to my class. By and by, however, came the realization that the men who wrote the books had told the truth, and that the development and growth of the body could not take place in any way other than that described. So it has slowly dawned upon everyone, who has earnestly studied the subject of internal secretions, that the papers presented this morning were only unraveling and making plainer the facts revealed by the careful and painstaking studies of the endocrines.

We had a striking illustration of a case of pseudopregnancy in Cincinnati, which occurred about forty years ago. A well-trained practitioner, who enjoyed a large obstetric practice, was consulted by a woman who had never been pregnant, though married eighteen years. She had always been eager to have children, and felt correspondingly depressed because of her inability to become pregnant. Quite unexpectedly she visited her friends and confidentially informed them that, at last, she was to become a mother. She went to the doctor and engaged his services for the anticipated confinement. Without an examination the usual advice was given and all the arrangements for the approaching event were made. When the time came, she began to have pains, the doctor was sent for, remained all night, most of the next day, and again the following night. Still, no child was born. Toward the morning of the second day, Professor William H. Taylor, the first president of this Association, was called to see the case in consultation. He found the patient sleeping soundly. After she awakened he was ushered into the room, made an examination, and to his astonishment found her abdomen flat as a pancake, and discovered that no child had been born.

Dr. Bandler (closing the discussion on his part).—I want to spend two or three minutes in discussing the papers of Drs. Hayd and King, which were extremely interesting to me. For many years all of us have known, even the tyro in medicine, that the ovaries are concerned with menstruation and the ovaries are female glands, but it took many years before our specialists realized that the thyroid was a female gland, as you have seen from the paper which was read by Dr. Hayd.

In the last three or four years we found that the pituitary gland, especially the posterior lobe, is a female gland, as Dr. King has shown in his résumé of the physiology, so that we as gynecologists, with all the disturbances of menstruation to contend with, must think in every case of the ovary, the thyroid, and the pituitary gland, all three being involved practically in all these cases.

Dr. Hayd's case of Raynaud's disease is interesting. I have had a number of what may be called "baby cases." Hyperthyroidism is a "baby type" of exophthalmic goiter. We see girls who have a poor circulation, blue hands, and cold feet. They do not stand the winter well; they get along better in summer. We can improve them tremendously by the use of the thyroid extract. They suggest minor types of Dr. Hayd's case.

Dr. King showed three types, from the "baby form" to hypopituitarism, and then the extreme types of dystrophia adiposis genitalis. There is not one of you who has not seen various gradations of pituitary upset. Anyone can recognize the extreme type, but what we want is to fix our attention on the signs by which we may be able to recognize the minor types.

Physically we can recognize these types. I have made many diagnoses of submerged exophthalmic goiter by a slight prominence of the eyes. I make it a point to look carefully at every patient who comes into my office and by so doing I am able to diagnose many cases of hypopituitarism or pituitary anomaly by the little graceful hands. Take the fat woman in a circus with fat arms and fat legs, and when you shake hands, you realize she has a pituitary anomaly. When a man is thick and broad-chested and is as powerful as an ox he has an anterior lobe that has done good work for him.

I wish to call attention now to the nerve element, because every one of these glands not only controls physically the growth of the individual and of the physique, but the nerve element. We know that the nervousness of the hyperthyroid case does not have to be an exophthalmic goiter case. We know the depression of hypothyroidism, which almost amounts to melancholia at the menopause and at other periods. We know the exaltation of hyperthyroidism. We know the exaltation of pituitary anomaly; we know the depression of the posterior lobe anomaly.

I am very proud of our specialty of obstetrics and gynecology, and I do not subscribe to the ideas of any man who says that the day of gynecology has passed because the gynecologist does general surgery, or the general surgeon does gynecology. In every community a man must be a gynecologist and an obstetrician to be a real, thorough specialist. That is the dignity of this specialty; but in addition to that, every good specialist must be a good neurologist, and the discredit, that is cast upon gynecologists by the neurologists on the one hand, and the internists on the other, is due largely to the fact that we have not in the past given as much attention to the neurological aspects of our cases as we should have done, but we are doing it now. We are meeting our problems now with brains. It is just as essential to know when to operate as to know when not to operate.

When a woman has had one or two children and is nervous, depressed, and suffering from one symptom or another, and has trouble with her husband or her mother-in-law, you can see that woman is not well. But the chances are she has been to her physician or a specialist and he has found nothing wrong. Her ovaries are normal; the uterus is in good position and everything else is right. He hesitates to do anything for her. But when that woman says, "I am tired and nervous; I am sleepless," he begins to think she is one of those women who have no backbone and pretty soon she begins to think she has no stamina. These women may have hyperthyroidism and hypothyroidism; they may have pituitary anomalies. Why operate for retroversion or retroflexion of the uterus when that has nothing to do with the individual's condition? If the ovarian secretion is not doing its work, reacting on the thyroid;

if the thyroid is not doing its work; then our specialty should rise to the dignity of a science and decipher these abnormalities. That is why papers like those Dr. Hayd and Dr. King have read fix our attention on the nervous side of gynecology, teaching us things which lead to other paths and reflexes, which is one of the most important problems to deal with.

Dr. King (closing the discussion).—If there is any one thing that indicates the confusion regarding many of the clinical conditions that result from perversion of the glands of internal secretion, it is the discussion which these papers have brought forth. In my own contribution I hoped to call attention to certain clinical types of pituitary perversion, which with our better understanding in the future, we may be able to classify more satisfactorily.

As to the pseudocyesis of hypophyseal dystrophy, I do not wish to be understood that I consider all women who rapidly put on weight as being sufferers from pituitary perversion, nor is every woman who thinks herself pregnant a victim of pituitary disease. I do bespeak the interest of the profession, however, in those cases which are unquestionable to be attributed to disturbance of the hypophysis and which present a definite constant syndrome. In this connection there is possibly a historical character that may have been a victim of pseudocyesis of hypophyseal dystrophy. You will recall that during the reign of Mary Tudor, her realm on several occasions was excited by the news that she was to have an heir and she made elaborate and detailed preparations, but each time when the event should have taken place nothing further happened.

EDITORIAL

THE MORTALITY FROM CHILDBIRTH.

Within recent years attention has been called to the fact that, as compared with other causes of death, there has been no corresponding decrease in this country in the mortality associated with pregnancy and childbirth. Thus, statistics have shown that the death rate from typhoid fever between 1890 and 1913 fell from 46.3 to 17.9 per 100,000 population, for diphtheria and croup from 97.8 to 18.8, for tuberculosis from 252 to 147.6, for pneumonia from 186.9 to 132.4, changes for the better which are remarkable and startling when compared with the figures relating to diseases caused by or associated with pregnancy and confinement. These ratios refer to the so-called registration area, which in 1913 included between 65 and 70 per cent. of the total population of the United States and are based on the mortality tables derived from the last national census.

From the same source we obtain a total mortality associated with the childbearing function in women, of 15.3 in 1891 to 15.8 in 1913 for a like ratio of population. If the death rate per 100,000 women of childbearing age is inquired into, we find during the census year 1900 a total of 50.3, including 21.6 for puerperal sepsis alone. A more accurate compilation would be one based on the number of deaths per 1000 live births, but this has only been done in a few States in the registration area, although here we note a rate of 6.5 per 1000, or speaking in larger figures and round numbers, about 3600 out of 562,000 pregnancies with live births, had a fatal termination. In over half of this number, septicemia in some form or other, was the cause of death. Comparing these figures with those obtained from foreign countries, the United States cannot be said to occupy an enviable position, as in a table of the mortality rates per 100,000 population, including sixteen countries, the United States stands fourteenth on the list. While a more intensive study of the subject and a recognition of possible sources of error in gathering and comparing statistical information, may modify somewhat this statement, yet the fact is becoming increasingly manifest that satisfactory progress in the prevention of childbed mortality has not been made in this country. This is conclusively demonstrated in the study made by Dr. Grace L. Meigs of the Children's Bureau in Washington,* and the case is so well stated that it calls for further and more intensive study. Material for this inquiry must be secured from many centers of population throughout the country, but unfortunately not all of the States have available or satisfactory vital statistics and compulsory reports of deaths and certain diseases are not demanded in every State. Other countries have recognized the necessity of according full appreciation to the study of the mortality from childbirth and, particularly where this is accompanied by a fall in the birth rate, even the highest governmental authorities have given their close attention to the matter. Witness the discussion in France, for example, and the recommendations proposed by the Academy of Medicine to the National Government for the conservation of maternal and infant life as an important economic factor upon which the very existence of the nation depends.

Puerperal sepsis claims a large proportion of the deaths associated with childbirth but this cause as well as many others must, in the light of present-day knowledge, be admitted as largely preventable. If so,

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*Maternal mortality from all conditions connected with childbirth. (*U. S. Dept. Labor, Bureau Publication, No.* 19.)

why has there not been a more determined effort to improve the situation? Why has not the medical profession manifested a more intense desire to correct this unfortunate state of affairs, if it can be corrected? Shall we wait for the laity to take the initiative? This would be a sorry fact for the medical profession to admit and it is to be hoped that the united efforts which have succeeded so well in the battle against tuberculosis, typhoid, diphtheria, and other diseases that have been shown to be preventable, may be duplicated in the fight against fatal complications attendant upon pregnancy and childbirth. It may perhaps be admitted that the problem is vastly different, of more varied aspects, of greater extent and more difficult of approach, but when one takes into consideration the numerous social and economic, in addition to the purely medical phases involved, the attempt to solve it is certainly worthy of the sincere, immediate and undivided attention of the medical profession. It will not do to postpone this issue, for the question is one that as elsewhere, has a most intimate bearing on our national life and existence.

What steps shall we take to solve the problem? What practical measures shall be instituted to bring about a reduction in the mortality rate of childbirth that will accomplish in the next two decades a result comparable with that achieved in the treatment of tuberculosis, typhoid, and numerous other diseases, when the number of cases of puerperal fever, for example, will be reduced to levels reached with the modern treatment of diphtheria. Many competent medical observers believe that improvement will follow greater recognition given to the proper teaching of obstetrics, including practical hospital work under competent instructors, and this requires that a dignity commensurate with that accorded to other departments of medicine must be extended to this branch of medicine. Others believe that proper instruction and closer observation of the midwife will accomplish the desired result, among certain classes of the population at least. Again, there are those who claim that adequate prenatal care by institutions, or otherwise, should be exercised and sufficient hospital facilities be provided, particularly for women of moderate means. State grants of money awarded to mothers of families, whose economic status may require such aid, has also been suggested.

There is no doubt whatever that in carrying out the above requirements important gains will result, but we must also go further afield in any endeavor to solve the problems. A more intensive study of the subject is demanded than has heretofore been possible and among other things an attempt must be made to find out under what circumstances the fatalities attendant upon childbirth occur, the proportion of deaths in hospitals and homes, in the practice of private physicians and midwives, in normal and abnormal deliveries, in a more detailed consideration of the preventable and non-preventable causes. Steps should also be taken to develop a greater public interest in the question, so that the importance of maternity and its successful termination shall be impressed on the minds of all men and women. This may require a departure from the accepted tendency of the present-day to overlook the biological differences between the sexes. Perhaps at this time we can well postpone the discussion on this point, yet come to plague us it will, and the rise of "feminism" may needs be halted, but let us hope that a more profitable development in other directions of feministic effort may be the result. Maternity and the proper recognition of the peculiar functions of women in this world must receive adequate acknowledgment and recognition before we can hope to reduce the element of danger which accompanies it. That we may ever eliminate entirely the factor of risk in childbirth is out of the question for we have no direct control over many of the complications of pregnancy and labor, but a greater effort must be made to reduce the preventable complications and the mortality which attends them. A failure to do so can only reflect on a profession which has come to regard the prevention of disease as one of its leading and important functions.

REVIEWS.

DISEASES OF THE STOMACH. A Text-book for Practitioners and Students. By MAX EINHORN, M. D. Sixth revised and enlarged edition. Pp. 569. New York: William Wood and Company, 1917.

This edition, like its predecessors, is intensely charged with the personality of its author. It is largely a compilation from the writer's magazine publications to which frequent and copious references are made, and contains numerous case reports. Special prominence is given to the writer's own methods and apparatus. Among the recent advances in diagnostic methods he refers briefly to fractional gastric analysis as useful in important cases, though he believes the usual stomach-tube procedure will remain the clinical method.

Clinical Gynecology. By James C. Wood, A. M., M. D., F. A. C. S. Formerly Professor of Obstetrics and the Diseases of Women and Children in the University of Michigan, Homeopathic Department; and of Gynecology in the Cleveland-Pulte Medical College; Founder Member of the International Periodical Congress of Gynecology and Obstetrics; Gynecologist to the Huron Road Hospital; Expresident of the American Institute of Homeopathy, etc. 1917, New York, Borricke & Tapel.

The author presents a series of clinical lectures dealing with the various gynecological problems in an unusually interesting monograph. His foreword emphasizes in a truthful, conservative and convincing manner the scientific reasonableness of Homeopathic prescribing as an adjunct to surgical and other therapeutic measures and in Chapter XIV he makes clear his belief as to the sphere of the indicated remedy when he says, "It has ever been my aim in conducting my clinics to impress upon those present the necessity of overcoming toxic, surgical and mechanical conditions before prescribing the indicated Homeopathic remedy."

In the clinical subjects discussed, the author has selected cases with well prepared histories, physical examinations, laboratory findings and careful diagnosis; the indications for operation are clearly stated; the operation itself briefly outlined; the prognosis and conclusions so presented as to aid the student in visualizing the problem and retaining a mental picture of the case.

From the chapter on Dysuria and Dysmenorrhea, through the consideration of Cancer and major operative conditions, to the final subject of postoperative treatment, the reader is impressed by the emphasis on careful diagnosis, conservative yet thorough operative procedures, and prognosis and conclusions stated in a concise manner that carries the conviction of years of study and long surgical experience.

The chapter on specific inflammation of the female pelvic organs, comprehensively treats of the Neisserian infection, its complications and sequelæ, its radical and conservative operative treatment, and even a frank discussion of ways and means to curtail its origin and dissemination.

The treatise of uterine hemorrhage briefly accurately groups the pathological condition capable of causing hemorrhage, the differential diagnosis and the surgical, medical and adjuvant treatment.

While there are points in which one may differ with the opinion of the author, as for instance, his routine use of iodoform gauze for drainage, packing, tamponing for hemorrhage and his use of pure carbolic on the endometrium, on the whole, the volume is an example of "multum in parvo" in gynecology, that holds the interest of the reader throughout and is replete with sound judgment and practical help, especially to the student and general practitioner of the homeopathic school.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Cause of the Depopulation and Repopulation of France from the Medical Viewpoint. Jayle (*Journal de Medecine de Paris*, September, 1917) bases his article on work done by himself twenty-seven and fifteen years ago respectively. His earlier labors dealt with the physiology and pathology of the female genitals while the more recent effort was concerned with the progress of French natality. He is quite satisfied that in nine cases out of ten it is the will of the husband which is responsible for the decrease of the birth rate. Very few women indeed refuse outright to bear children although they wish to limit the number of births. Not a few are willing to bear from four to six children if economic conditions permit it. Absolute sterility in woman is rare but sterility from some preventable cause rather common. Repeated injections for the prevention of conception can work harm to the natural local defences against infection and certain apparatus (syringes) should be sold only on physicians prescription, and should not be exposed for sale. Restriction in the number of births increases the percentage of dystrophic children, or in other words tends to degeneracy. This has been proved for certain communities beyond doubt. The relatively few children, raised in economic ease fall victims to tuberculosis, alcoholism and venereal infection, all of which argues for the association of degeneracy with low birth rate. Any plan for repopulation requires at least a generation. Children must be raised by their parents and among other children and raised practically out-of-doors. Country women with large families require State aid. Repopulation implies country life—the rural districts must be repeopled. This means good water supply and sewerage, hospitals and maternity homes, electric power—in short the advantages of urban life. There should be sanitary tenements and flats in the larger towns. Healthy children and adolescents satisfying certain requirements of height and weight must receive an annuity of 100 francs: so that a family of ten children under the age of eighteen would receive a State income of 1000 francs. This course of procedure can alone antagonize the anticonceptional propagandists who only tell the truth when they assert that to beget children without maintenance is unjust. There should be a generation tax for the childless who are able to pay it, the proceeds to apply in the fund for the maintenance of children.

Small Doses of Pituitrin for Inducing and Shortening Labor at Term.—The claims of A. Stein and H. Dover (*Med. Rec.*, 1917, xcii, 238) are based on experience with sixty-four cases during labor and thirty-four cases for induction of labor at term. They state that the best mode of administration is by the intramuscular injection of an average dose of two to four minims. Pituitrin in small doses should be employed in labor at term exclusively, never for the induction of abortion or premature labor, where it would fail entirely.

It is indicated after the onset of labor for strengthening the uterine contractions; also in combination with castor oil for the induction of labor at full term. It may be utilized as an efficient adjuvant to the bougie method. The judicious employment of these small, entirely harmless doses of pituitrin serves to reduce the need for the application of forceps, thus causing otherwise instrumental deliveries to terminate like normal progressive labors.

GYNECOLOGY AND ABDOMINAL SURGERY.

Cyst of the Urachus.—Chavannaz (*Annales de gynécologie et d'obstétrique*, July–August, 1917), formally places on record a case of this anomaly because of the infrequency of its incidence. The patient was a single woman of twenty-four of apparently good stock, although the mother has had four miscarriages in eight pregnancies. The patient's own antecedents were good until three years before consultation when a painful bowel trouble first set in. The symptoms appeared in crisis, lasting from one to three days and quite distinct in point of time from the menstrual period. There had been several attacks annually. Shortly before consultation there was an unusually severe crisis with general gastric and urinary symptoms, suggesting torsion of the pedicle of a parovarian cyst (the abdomen was now sensibly enlarged). The immobility of the supposed cyst was not understood and a trial subumbilical laparotomy soon showed that this diagnosis had been erroneous. The presence of the cyst made it impossible to examine the uterus, ovaries and bladder. After the cyst had been nearly evacuated by puncture it was possible to feel the uterus. Attempts at extirpation of the cyst threatened injury of the bladder, but sounding the latter revealed the existence of a cleavage plane which should render separation possible. The cyst, which had no true pedicle, was readily extirpated and a negative examination of the pelvic viscera made it possible to reach the diagnosis of cyst of the urachus. There was smooth recovery from the operation. The examination of the specimen by Sabrazsè confirmed the clinical diagnosis.

Use of X-rays in Certain Forms of Ovarian Dysmenorrhea.—F. Hernaman-Johnson (*Practitioner*, 1917, xcix, 10) says that in dysmenorrhea of ovarian origin, when drug treatment has failed, and when there is no gross surgical lesion, a trial should be given to *x*-ray treatment. The first period may be worse, and the second may show but little improvement. The third should be unmistakably better. If it is not, treatment by *x*-rays should not be pushed. With our present knowledge no attempt should be made, in the case of young women, to do more than depress somewhat the ovarian activity. Should the ovarian secretion be so vitiated that its total suppression is called for, surgical removal is indicated.

Use and Value of Sulphur in Vaginitis.—F. P. Gill (*Practitioner*, 1917, xcix, 85) recommends for cases of vaginitis the local application of an ointment of precipitated sulphur, one third strength, applied on lint night and morning after a cleansing douche.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATION.

A CASE OF PELLAGRA IN A CHILD RESIDING IN THE DISTRICT OF COLUMBIA.*

BY

JOHN FOOTE, M. D.,

Washington, D. C.

(With one illustration.)

WHILE the cause of pellagra is not definitely known, it is believed to be due to a lack of certain elements in the food necessary to proper metabolism. Treatment based on this hypothesis has been most effectual in the hands of Goldberger and his co-workers who have advised liberal feeding with protein foods and forced feeding generally. The hypotheses that the disease is due to a diet of corn products or that it is a sensitization of the body tissues to cane sugar and maize products have obtained some credence. While it is most frequently found in subjects between the ages of twenty and fifty, it is far from unknown in children, and indeed, some of the most remarkable results obtained by Goldberger came in the treatment of children in an institution in the South. In America more females seem to be affected than males. It occurs most frequently in the spring and autumn, and seems to prevail mostly in warm climates such as Italy and some of our Southern states.

It was a matter of surprise that ten cases of this disease were recently under treatment in the District of Columbia. Many of these were in the negro race and came to Washington Asylum for observation as to their mental condition. They followed the usual trend in being adults. The occurrence of the disease in a child, and especially the fact that the symptoms seen in the mouth are suggestive of another disease of nutrition seen in younger children, scurvy, is sufficient excuse for reporting this case of a condition which is far from being unknown, or even uncommon, in communities farther south of us.

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* Presented at a meeting of the Washington Obstetrical Society, January 9, 1917.

The symptoms of pellagra are principally manifested in the skin, alimentary tract and nervous system. The so-called diagnostic triad consists of symmetrical erythematous eruptions, stomatitis, and diarrhea, all these conditions persisting over a considerable period of time.

The skin lesions are found frequently on the hands, neck or other parts exposed to the sun. The skin is rough, of a dark purplish red, it burns and itches, and often bullæ appear. The eruption is symmetrical—it is usually present on both hands or wrists or legs. After awhile, on parts of the body rubbed by clothing, as the neck, brown, pigmented patches appear. The butterfly-shaped pigmented patches at the collar band are almost pathognomonic, some authorities assert. Desquamation follows the acute period of the eruption, usually after about two weeks. The eruption usually disappears in the autumn and reappears in the spring.

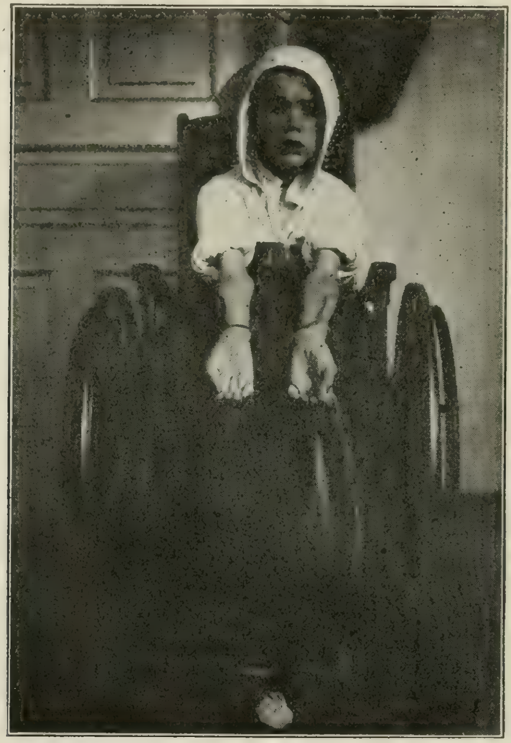

FIG. 1.—Case of pellagra in a child.

The alimentary tract symptoms consist of stomatitis, gingivitis, and symptoms of gastrointestinal indigestion, especially diarrhea.

The nervous symptoms consist of melancholia and sometimes mania. Not infrequently epileptiform convulsions occur. A fine tremor is present, and usually increased patellar reflex and ankle clonus. There is rapid loss of weight and strength. The gait resembles that of spastic paraplegia. The disease is characteristically chronic and in most cases progresses rather slowly.

The appended case report comes from my service in the pediatric ward of Providence Hospital:

HISTORY.

Eleanor M., aged eleven years, female, white, school girl.

Complaints.—Loss of weight, sore mouth, diarrhea, rash on skin, general weakness. Family physician says it looks like "scurvy."

Family History.—Mother living and well. Father died of acute nephritis. One sister died at the age of three years of pneumonia. Three brothers living, two are healthy, one has a rash on skin, and legs are swollen. No family history of pulmonary tuberculosis, insanity, epilepsy, or pellagra obtainable.

Past History.—Natural birth, breast fed. Usual children's diseases with good recovery. Stomach trouble three years ago, called "gastritis." Lasted for one month, did not vomit, complete recovery. No other sickness known. Patient has always lived in Washington, until two months ago. At that time father died and patient was put in a receiving home in Barcroft, Va. Home in Washington is well ventilated and lighted. House is plumbed. No dampness. On the whole it is described as a sanitary home.

Present Illness.—Began about one month after going to Barcroft, Va. (one month ago). First complaint of patient was a complete loss of appetite. The only thing that she would take was coffee. She began to cry for her mother. No pain at all. On Sept. 10, 1916, patient's mother went to Virginia to bring her back to Washington. At that time patient's hands were rough and reddened on the dorsal side, since then this has spread up to the elbow. Patient first complained of having a sore mouth at this time. Since coming home she developed a severe diarrhea. Bowels moved about six times a day and movements were very foul. Patient now has a slight cough. Lost 50 to 60 pounds in four to five weeks. Mentality normal as far as mother can judge. Has noticed no change. While in this house in Virginia, her chief food was gruel or mush. She had this every day and sometimes more than once a day. Also had bread and potatoes and coffee. Patient says that she did not have much corn, and does not know if the mush was made of corn or not, although she says that she thinks it was corn-meal mush. Patient had meat, but not often.

Physical Examination.—Patient is apathetic, does not respond to her name, will not talk. Looks sullen and suspicious. Skin looks anemic, dry and rough. On back of neck three connected spots of pigmented, reddened, scaly skin, form butterfly figures; over back of hands around wrist and up extensor surfaces of forearm this same roughness is seen. Has definite, well-marked borders. Borders not raised. Coarse black hair, matted, pediculosis capitis present. Face slightly fuller on left side; looks old for age.

Eyes.—Pupils regular in outline and equal. React to light and accommodation. Extraocular movements normal. Eyes sunk deep into orbits.

Muscles and Skin.—Skin flabby and wrinkled. Bones prominent. Tissue turgor much diminished. Muscles flabby.

Mouth.—Tongue fissured and bleeding. Thick yellow coat on base of tongue. Foul-smelling mucous flowing from out corners of mouth.

Gums.—Raw and bleeding. Teeth widely separated and loose, not pegged or notched.

Neck.—Submental and submaxillary glands large, hard. Posterior cervical glands palpable. Thyroid gland small.

Chest.—Expansion equal. Tactile fremitus, percussion and auscultation are normal.

Heart.—Apex beat is rather diffuse and is best seen in 4th i.c.s., ½ inch inside nipple line. Rate is fast, no murmur, beat regular. Aortic second sound louder than pulmonary second sound.

Abdomen.—Scaphoid. Liver slightly enlarged and palpable; edge felt 2.5 cm. below costal margin in mammary line. Spleen not felt. Abdomen tender, hard.

Extremities.—Biceps and triceps jerks equal and brisk. Knee-jerks equal, distinctly exaggerated. No ankle clonus. Plantar flexion. Soles of feet fissured and rough. Epitrochlear glands not felt.

The patient was placed in bed and appropriate symptomatic treatment instituted for the parasitic skin disease, the sore mouth, etc. A diet of 1 quart of milk, 2 eggs, 3 ounces of beef juice and 2 ounces of lamb, beef, mutton or chicken daily, with abundant bread and vegetables, was instituted, no stringy vegetables being given. The symptoms quickly subsided, the eruption completely desquamated and the stomatitis soon was cured. The diarrhea was somewhat intractable, but by the end of a month was practically cured. The mental condition improved gradually, until now patient laughs and plays with toys and talks to the other children, though still somewhat retarded. The weight on entry was 57 pounds; it is now, after something less than 3 months, 68 pounds. Macular eruptions on the arms and back appear from time to time. The patient is fed every four hours and has a good appetite, but gains weight slowly.

1726 M. STREET.

THE MINOR NEUROSES OF CHILDHOOD.

BY

J. EPSTEIN, M. D.,

New York City.

The easily fatigued and disturbed nervous system of the child predisposes it to various neuropathic and neuropsychopathic abnormalities. The mental processes and motor acts of the young child are under a feeble inhibitory control, which makes it susceptible to various reflex neuroses. Children who have inherited a weak unstable nervous mechanism or live amidst unfavorable surroundings frequently suffer from functional disorders of all kinds. Through a morbid intuition or imitation, a child may acquire certain bad habits specially those which cause a pleasurable sensation or satisfy a perverted taste.

Habit Spasms.—These are quick, sudden, convulsive muscular movements, voluntary in the beginning but later becoming habitual and not entirely under the control of the will. Habit spasms and tics in childhood are the result of a disturbed nervous balance. In many cases there is an underlying inherited neurotic temperament or an acquired nervous irritability and a loss of nerve tone. These children, as a rule, suffer from poor appetite, constipation and restless sleep. They are difficult to train or control and frequently grow up as so-called bad, spoiled, or incorrigible children. The spasms may vary in degree, intensity and character. There may be jerking of the head, shrugging of the shoulders, biting of the upper or the lower lip, blinking of the eyes, or contraction of the facial muscles giving rise to all kinds of grins and grimaces.

Treatment consists mainly in removing or improving the underlying nervous instability and in the proper training of the child. Kind but forceful discipline should govern the daily actions of the child. Punitive measures frequently do harm. All sources of reflex irritations, as errors of refraction, abnormalities in the nasopharynx or disturbances in the genitourinary tract should be relieved. The child should be removed from such surroundings where it might acquire habit spasms by imitation. Plenty of rest in bed will do much good. A simple nutritious diet to strengthen the weak nervous system of the child is imperative. A cool sponge bath in the morning and an occasional warm bath at night is very helpful.

Small doses of bromides and tonics like iron, arsenic, quinine, and strychnine are of value. I found a combination of the glycerophosphates of iron and calcium does much good.

Nodding Spasms.—Head nodding or *spasmus nutans* is a functional nervous disorder of early childhood, affecting the head only. There is a more or less constant shaking, rotating or nodding movement of the head, frequently associated with similar movements of the eyes. The character of the head movements may not always be the same, shaking, nodding, and rotating may be associated, may alternate, or replace one another. When the child's attention is firmly fixed on some object, the head movements may increase or cease. All movements stop during sleep. Nystagmus is frequently a concomitant symptom due probably to retinal changes or instability of the ocular muscles. The vibratory eye movements are usually more rapid than the head movements and they may be of the same, or of a different character than the head movements.

The exact cause of this disease is unknown. A history of a hereditary neuroses may be obtained in some cases. Head and eye nystagmus as a familial disease has been reported. Rickets, gastrointestinal diseases, improper food and poor surroundings are predisposing causes. Living in dark rooms has been shown to be an important etiologic factor.

The prognosis is usually good. Fresh air, fresh milk, plenty of sunshine, good nutritious food, suitable to the age and digestive ability of the child together with cod-liver oil, iron, and phosphorus will cure this disease. Calcium bromide has given me good results.

Night Crying, Night Terrors or Pavor Nocturnus.—Healthy infants and children sleep in profound tranquility. The newly born infant sleeps almost all the time, it may be awake two out of the twenty-four hours. During the first six months the normal infant sleeps from sixteen to eighteen out of the twenty-four hours and at one year, he sleeps from twelve to fourteen hours. From the first to the fourth or fifth year a healthy child should sleep in quiet contentment for ten or twelve hours. Children who are restless, tossing or crying at night are either hungry or overfed. It may also be due to an uncomfortable position, wet night clothes, obstruction in the nasopharynx, pin worms, masturbation or either a too high or a too low temperature in the room. Some children after tossing around for an hour or two during sleep suddenly startle the household with wild crying and screaming. They are usually terribly excited, tremble with fear, are terror-stricken and seek protection and consolation from the mother. The nervous fear soon abates and they fall asleep to awaken the next morning with little or no recollection of the occurrence. These children, as a rule, have inherited a weak, unstable nervous system under a feeble inhibitory control and, when to this is added some reflex irritation from any part of the body, it produces a condition of extreme excitement and night terror. In some cases, fortunately not many, a neurotic child has had some unusual excitement during the day or put to bed under the calm influence of foolish fairy tales about wild animals, ghosts and goblins, after sleeping for some time in profound repose, suddenly awakens with a cry of terror. He screams with an agonizing fear in wild excitement, points to horrible imaginary objects and gesticulates incoherently. During all this time he is not really awake but is in a semiconscious dazed state. After a little while, the excitement passes away and he falls in a quiet sleep. Thus a boy, six years old, was brought to me for treatment because he gets up almost every night about three hours after retiring and either sits up in bed and screams in great fear of some imaginary person or crouches under his blanket to protect himself against an intruder and cries bitterly but quietly till he falls asleep.

In the mild cases the prognosis is good because the etiological factors can be ascertained and removed, while in the severe types of night terror the outcome depends on the underlying hereditary nervous taint, mental condition, and the surroundings.

Treatment consists in removing all possible sources of discomfort, irritation and excitement, and in lessening the hours of mental strain. School children should not be overworked. Nasal obstructions of all kinds should be removed. The gastrointestinal tract requires careful attention. The general health must be improved by a proper diet, plenty of fresh air and sunshine. A warm bath at bedtime is helpful. A fairly large dose of sodium or calcium bromide should be given at night. Tonics such as iron, quinine, arsenic, malt and codliver oil are indicated and will do much good.

Thumb Sucking and Nail Biting.—This is a habit neurosis of childhood. It has its origin in the natural law of self preservation. The first constructive act of the newly born infant is to suck the breast. Sucking and taking everything in the mouth is a normal instinct of the infant and the young child. When there is nothing else within easy reach of the child to take in the mouth, it sucks its thumb with evident comfort and satisfaction. In this way the habit is gradually formed. Older children indulge in nail biting instead of thumb sucking.

While this bad habit of thumb sucking or nail biting does not usually produce constitutional disturbances and has apparently no inhibitory influence on the development of the child, it is likely to carry infection into the mouth and produce certain deformities of the thumb or nails as well as of the mouth.

Successful treatment of this habit is more or less difficult depending on the length of time the child was allowed to indulge in it. Mechanical devices may be necessary to restrain the child from continuing this abnormal act. The application of a solution of quinine to the thumb may be sufficient to break up the habit. Older children must be constantly watched for nail biting and the habit broken up by appealing to their sense of propriety and dignity, or by suitable rewards, but never by punishment. The general health of the child must be improved and the nervous system strengthened by proper food, hygienic surroundings and pleasant diversions.

Dirt Eating or Pica.—This is a peculiar neurosis of childhood, characterized by a perversion of the appetite. It is frequently associated with the habit of thumb sucking. This perversion of appetite impels the children to eat such indigestible and injurious articles as dirt, plaster, chalk, sand, coal, paper and almost everything else within reach. The habit of dirt eating usually causes them to refuse proper nutritious food and leads to malnutrition, anemia and intestinal disorders. A boy of sixteen months was brought to me because of recurrent attacks of abdominal pain and diarrhea. A careful history elicited the fact that he eats everything within reach and has a special desire for coal and wood; he delights in eating the toothpicks which he usually manages to find in the house.

The etiology of this curious anomaly of appetite is obscure. The unconscious desire in the young child to survive in the struggle for existence impels it to feed on everything within reach. This probably creates a special sense of taste for dirt which is normally not present in children who are prevented from the habit of putting everything in the mouth or constantly sucking the thumb. A functional gastric neurosis may be a contributing factor, for it usually occurs in neurotic children of neurotic parents.

Treatment consists in forcibly breaking up the habit. The child should be under constant supervision and prevented from getting these injurious articles. A proper, tasteful, nutritious diet should be given. Out-door exercise and interesting plays will divert the child's attention and make it forget the injurious habit.

Masturbation.—Masturbation in infancy and childhood is not uncommon. This infantile or youthful type of masturbation is produced by irritation of the genitals with a resulting orgasm but without a knowledge of sexual life and sexual feelings. Boys and girls are about equally affected. No ages are exempt. I had under my care two infants nine and twelve months old and a boy of five years, all inveterate masturbators. The diagnosis is frequently not made and these nervous, fretful, and irritable children are treated for gastrointestinal disturbances, teething, and everything else. These youthful masturbators are usually of a neuropathic constitution, and any kind of nervous irritability causes a hyperexcitability of the nervous system. The cause of this bad habit is usually due to some irritation around the genitals or anus which impels the child to indulge in rubbing, scratching or friction of the parts. These bring to the higher nerve centers a pleasurable sensation peculiarly its own, and arouses in the child a desire for frequent repetition.

The prognosis in mild cases is good. No harm is done from slight masturbation. But when the infant or child indulges in excess, temporary or permanent harm may result.

Treatment consists primarily in removing the cause which is usually found along the genitourinary tract or anus. Rough and ill fitting diapers or underclothes may keep up a constant irritation of the genitals. The hyperexcitable nervous system must receive proper care. Small doses of sodium bromid three times a day after meals, or one fairly large dose at night will do much good. In infants the pernicious habit can easily be corrected by suitable clothes or diapers properly applied. Older children must be kept under constant supervision. Dietetic and hygienic treatment is essential as in all cases of neurosis. Kind but strict discipline is helpful. The pleasurable sensations of masturbation must be removed from the field of thought by substituting some fascinating and highly interesting diversions which will be uppermost in the child's mental processes.

222 East Broadway.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Stated Meeting, Held October 11, 1917.

DR. ROGER H. DENNETT, *in the Chair.*

DR. SARA WELT-KAKELS presented a case of

AMAUROTIC FAMILY IDIOCY.

This patient was a female child, which came under my care at Mount Sinai Hospital, in March, 1916, when she was five months old. She gave no history of consanguinity, tuberculosis or syphilis. The pregnancy was normal and the child was perfect at birth. At the age of six months the mother noticed that the child could not hold her head up and could not see well. At the age of eight months there was a white opaque spot in the eye-ground indicating optic nerve atrophy. There was also slight twitching and later convulsive seizures and contractures, especially of the upper extremities. The child had an attack of pneumonia and after that became worse. At the present time she showed all the classical symptoms of amaurotic family idiocy described by Sachs. The reaction of the muscles to faradic stimulation is somewhat delayed in some cases, but not in this one. The child had marasmus, difficulty in swallowing and the uncanny laugh which has been mentioned as characteristic of this condition. She has great susceptibility to acoustic and tactile stimuli. The head is very large in proportion to the trunk, measuring 51.5 cm. in circumference. The pupils are dilated and at times there is nystagmus. The patient makes no attempt to keep her equilibrium.

We made a lumbar puncture, and an examination of the spinal fluid gave negative results. The urine is also negative. A swelling of the dendrons of the embryonic nerve cells is pathognomonic of this condition. Etiologically it is generally accepted that this is an acquired disease.

At Dr. Koplik's suggestion I took some of the spinal fluid from this case and injected it into animals and then after some weeks examined the brain and spinal cord, but found no changes had taken place.

DISCUSSION.

DR. HENRY KOPLIK.—Contractures of the upper extremities, as shown in this case, are very rare. I have seen over one hundred cases of amaurotic family idiocy, but I have not seen this form of contracture, which might be taken for Little's contracture. Spasticity is not uncommon but it is uncommon to find this form of contracture in the upper extremities, and I am inclined to think that this is a terminal contracture. The etiology of these cases is very obscure. The majority are breast fed and it is hard to account for them except on the theory that they are due to toxemia. For this reason I suggested the injection of the spinal fluid from these cases into animals. Although the results of Dr. Welt-Kakels' experiments in this direction have been negative, I hope she will publish them as I believe they mark a step in advance in our knowledge of this condition. I am inclined to think with Hirsch that the condition is congenital and that possibly it is a toxemia; it is a question whether or not it is some form of a toxemia of pregnancy. It is, however, only a theory and that is why I suggested testing it by trying to reproduce the condition in lower animals by injections of the cerebrospinal fluid. The case which we have just seen is an exceedingly rare form of the disease.

DR. CHARLES A. ELSBERG read a paper entitled

CHRONIC INTERNAL HYDROCEPHALUS. THE NEWER METHODS FOR ITS RECOGNITION AND TREATMENT.

This paper is based upon forty cases of hydrocephalus in infants and young children which we have studied at the New York Neurological Institute and at Mount Sinai Hospital. Recent investigation has shown that the cerebrospinal fluid is more or less continuously secreted; under normal conditions it leaves the ventricles and is absorbed from the subarachnoid space of the brain and spinal cord directly into the blood stream. A number of investigators have shown that no fluid is absorbed by the walls of the ventricles, that perhaps a little may enter the blood stream by the veins of Galen, but that the greater part is absorbed by the villi of the arachnoid membrane over the convexities of the brain. There is considerable clinical and experimental evidence to show that there is a circulation of the cerebrospinal fluid and that it follows a regular course. From its source in the lateral ventricles, the fluid passes into the third, and through the iter into the fourth ventricle. It leaves the fourth ventricle by the foramina of Magendie and Luschka and the greater part of the fluid passes downward into the spinal canal on the posterior aspect of the spinal cord. The fluid is believed to pass upward on the anterior surface of the spinal cord and then to spread over the convexities of the hemispheres, from which regions it is, to a great extent, absorbed into the blood stream. If this scheme of cerebrospinal fluid circulation is accepted as the correct one, then it is easy to understand why spina bifida is so apt to be complicated by hydrocephalus and why the hydrocephalus is so apt to become aggravated under operative treatment of the spinal condition. The hydrocephalus which complicates spina bifida is often a true obstructive hydrocephalus, the obstruction being in the spinal canal instead of in the cranium. This the writer has been able to prove by studies of the absorption of phenolphthalein from the ventricles of such a patient which showed a marked retention of phenolphthalein in the ventricles with a normal absorption of the substance from the subarachnoid space over the cerebral convexities. The very satisfactory results of puncture of the corpus callosum in several of these little patients adds support to this explanation.

Recent investigations have taught us that there are three different types of hydrocephalus, that due to obstruction in the aqueduct of Sylvius or in the foramina of Magendie and Luschka, that due to diminished absorption, and that due to hypersecretion, or a combination of these. For the differentiation of these types from each other Dandy and Blackfan and Frazier and Peet devised a method in which phenolsulphonephthalein is used as an indicator. A normal standard of absorption from the ventricles and subarachnoid space and the time of normal communication between the ventricles and the subarachnoid space was thus determined. After introduction into the ventricles, phenolsulphonephthalein appeared in the urine in from ten to twelve minutes and during two hours from 12 to 20 per cent. was excreted. When introduced into the subarachnoid space the dye appeared in the urine in from six to eight minutes, and from 35 to 60 per cent. was excreted in two hours. The dye passed rapidly from the ventricles into the subarachnoid space and appeared in the spinal fluid in from one to three minutes. As an indicator carefully neutralized sterile phenolsulphonephthalein solution was used and the quantity excreted in the urine was determined by readings in the colorimeter. The method is as follows: After examinations have shown that the kidneys functionate normally, a lumbar puncture is done, a cubic centimeter of fluid withdrawn, and through the same needle a cubic centimeter of sterile neutral phenolsulphonephthalein (6 milligrams) is injected. It is important that the solution be neutralized as the alkaline solution is irritating to the central nervous system. All of the urine secreted during the succeeding two hours is collected and examined. If less than 30 per cent. of the phenolphthalein has been excreted, there is diminished absorption from the subarachnoid space. In the majority of cases in which the absorption was below normal we obtained values between 2 and 14 per cent. Four or five days after this test has been made a ventricular injection is given. In infants the ventricle is punctured through the lateral angle of the anterior fontanelle, 1 cubic centimeter of fluid withdrawn and 1 cubic centimeter of phenolphthalein injected. In older children a small trephine opening is made under local or general anesthesia. After one minute a lumbar puncture is performed, a few drops of fluid allowed to escape every minute and tested. Normally the phenolphthalein should appear in the fluid obtained by lumbar puncture within one to three minutes and should be strongly colored in three to five minutes. The fluid should be collected for two hours and tested in the usual manner. If phenolphthalein fails to appear in the lumbar puncture fluid within ten minutes the case is one of obstructive hydrocephalus, and if the patient is under anesthesia, the proper operative interference, puncture of the corpus callosum, can be done at once through the trephine opening. The trephine opening should always be made near the median line, just behind the coronal suture, so that a callosal puncture can be made through the same opening. If these examinations show that the normal communication between the ventricles and the subarachnoid space exists, and that there is either a normal or a subnormal absorption of fluid from the arachnoid, the next step is to determine whether the cerebrospinal fluid secretion is greater than normal. A lumbar puncture is done every day or every other day. Where the secretion of the fluid is normal, the quantity of fluid obtained at each puncture and the pressure the fluid becomes steadily less after the first two or three punctures. In hypersecretion, however, the amount of fluid obtained and the pressure under which it escapes remains constant for long periods. The occurrence of unilateral obstructive hydrocephalus may be determined by separate injections of phenolphthalein into each lateral ventricle. The forty cases of chronic hydrocephalus which we have studied were divided as follows: Obstructive hydrocephalus, ten cases; nonobstructive hydrocephalus thirty cases; nonobstructive with diminished absorption eighteen cases; nonobstructive with hypersecretion six cases; nonobstructive with diminished absorption and hypersecretion six cases.

A review of the various surgical procedures devised for the relief of hydrocephalus shows that they have all proved unsatisfactory. Based upon the modern conception of the different types of hydrocephalus, the ideal treatment of the obstructive form would be to reopen the closed iter, or the obstructed foramina, but up to the present time this cannot be accomplished. For the hydrocephalus due to hypoabsorption the correct treatment will have been discovered as soon as it is possible to increase the absorbing power of the arachnoid, but this may never be possible of accomplishment. We may be more sanguine that it will soon be possible to control hydrocephalus due to hypersecretion by means of a drug that will diminish the hyperactivity of the choroid plexus. The blind spastic infants with enormous heads, in whom there is complete optic atrophy and in whom there remains only a thin layer of brain cortex are, of course, beyond all help. The earlier the patients are sent to the surgeon the better the chance of relief by surgical procedures after the type of hydrocephalus has been determined.

In hydrocephalus due to obstruction in the aqueduct of Sylvius or the foramina of Magendie and Luschka a new channel between the ventricles and the subarachnoid space should be made by puncture of the corpus callosum. By a simple and technically easy operation, a small opening is made near the median line, the dura incised, and the cannula passed by the side of the falx cerebri, through the corpus callosum into a lateral ventricle. The opening is enlarged by manipulation of the cannula, which is then withdrawn and the dura and scalp closed by suture. In properly selected cases, in which actual obstruction had been demonstrated, the results of this little operation are very satisfactory and a complete cure may be effected. This is the most favorable variety of hydrocephalus for treatment up to the present time. The writer finds some evidence to show that puncture of the callosum may be worth while trying in patients with obstructive hydrocephalus in whom subarachnoid absorption has been demonstrated to be below normal. In cases of hydrocephalus due to hypersecretion, a lumbar puncture should be done every few days and the patient should be given thyroid extract in doses up to the physiological limit. From 15 to 30 c.c. of cerebrospinal fluid should be withdrawn at each puncture. The improvement in general symptoms will begin only after several months of treatment, and when the lumbar puncture demonstrated a diminished secretory activity of the choroid plexus. In hydrocephalus due to hypersecretion a certain number of satisfactory results can be obtained by a combination of thyroid feeding and repeated lumbar punctures.

Hydrocephalus due to diminished absorption is the type most unfavorable for treatment. Repeated lumbar punctures and thyroid feeding may be tried but in our experience we have seen very little improvement. We have not tried to drain the fluid into any of the cavities of the body as we feel convinced that real success cannot be expected from any of the methods thus far devised. In those who have had chronic hydrocephalus the size of the head will always remain larger than normal, but if there is papilledema, this will rapidly subside under successful treatment and there will be improvement in the eyegrounds and vision. If ataxia has been of long standing, it will require years for its complete disappearance, though marked improvement will occur within a few weeks after operation.

DISCUSSION.

Dr. Henry Koplik.—I have been watching the progress of Dr. Elsberg's work and have learned a great deal from it during the last few years. I have been placing as many cases as possible in his hands for this form of treatment, and I feel that we owe much to him, but at the same time I do not think that any great advance can be made in the treatment of hydrocephalus until we know more of its etiology. If the choroid plexus plays the part it is supposed to play in the production of hydrocephalus, it must have undergone certain changes, but we have no explanation of why some children suddenly get hydrocephalus or why children should be born with hydrocephalus. In order to get at the bottom of this question we should get the cases that develop hydrocephalus after birth earlier than we do. Some of the cases are very advanced at the time of birth and others develop the condition gradually and these latter cases are the ones that should be placed in the hands of the surgeon earlier, and Dr. Elsberg would like to have as many cases as possible. Even in the early cases it may be difficult to make a distinction between the postnatal and the antenatal cases for these two forms may very gradually emerge into each other. Many methods have been tried for the cure of these cases as Dr. Elsberg has brought out. It is very disquieting to read the reports in the European journals of repeated lumbar puncture as a cure. I have had no such success either in the obstructive or the nonobstructive forms of hydrocephalus with repeated lumbar puncture. There is some power that continues to reproduce the fluid. On the other hand many of these cases of moderate hydrocephalus make spontaneous recoveries and become useful members of society. I have such a case in Pennsylvania. In this child the head was larger than the one shown in the picture yet the child made a spontaneous recovery though the head is still large. Many of these cases that do not get well under operative treatment recover at the time the skull ossifies. This may be on account of the increased external pressure which is sufficient to stop the process. In other cases the process seems to stop before ossification, so that we do not know why the process comes to a standstill. Although we have these spontaneous cures I do not depend on a spontaneous cure by nature. Children that seem to have an inflammatory process of the brain or meninges should be watched from birth.

As Dr. Elsberg has said the most unsatisfactory cases to treat are those due to a diminished absorption and some of those shown on the screen may have been secondary to some form of inflammation. The results of puncturing the corpus callosum have not been as satisfactory as we might wish in the congenital cases.

Dr. William Sharpe.—Hydrocephalus has been such a discouraging condition that most doctors feel that it is utterly hopeless. Something was said in the discussion about authorities agreeing, but there is so little known about the condition that no one can really be considered an authority. We know little if anything as to the cause of the condition; we do know that the cerebrospinal fluid is secreted by the choroid plexus and excreted by the cortical veins, sinuses and possibly lymphatics, but we know little if anything of the cerebrospinal fluid itself. Personally I have studied many cases and have made a report upon forty-one cases to the Neurological Society in February, 1917; only fifteen of these were the type of internal hydrocephalus, that is, cases in which the ventricles were blocked. I have made autopsies upon each one of the cases that died (fourteen cases out of the total forty-one cases operated upon at that time) and I believe from my observations both at operation and at autopsy that most cases of hydrocephalus are due to a former meningitis and a blocking of the stomata of exit of the cerebrospinal fluid in the cortical veins and sinuses and possibly lymphatics. If the iter or the foramina of Magendie and Luschka are blocked, then that is merely an incident in the diffused process as there are still the other stomata of exit in the cortical veins and sinuses which are blocked, and so I feel that merely connecting the ventricles with the subarachnoid space by a callosal puncture is simply changing an internal into an external type of hydrocephalus and therefore little if any improvement can result. As Doctor Elsberg has demonstrated in pictures, we may have the ventricles dilated with fluid when the iter is not blocked so that merely puncturing the corpus callosum will surely not allow the fluid to get out of the cerebrospinal canal. The fluid must be given a means of exit beyond the cerebrospinal canal, that is, through the dura or into the blood stream itself. Thus, many methods have been devised to drain the ventricles when the ventricles have not been blocked and naturally the result has been failure. I am using a method of drainage for both the external and internal types of the condition through the dura into the subcutaneous areas of the scalp by means of linen strands and the results have been very successful. From these cases it would seem that it has been demonstrated that the cerebrospinal fluid is absorbed in the subcutaneous tissues of the scalp. In my series of fifty-eight cases operated upon by this method there were only seventeen deaths. The subject of hydrocephalus, however, is still in its infancy and any procedure, even though it gives negative results, should be given consideration.

Dr. Israel Strauss.—I think in discussing this paper it would be well to review the facts that have really been established. In the first place I shall have to take exception to the statement of the last speaker that we do not know what the cerebrospinal fluid really is. I think that if he will read Halliburton's article in a recent number of *Brain* he will learn that we know the composition of the cerebrospinal fluid and that it is secreted by the cells of the choroid plexus. From the work of Cushing and Ward we know that a certain amount of the fluid is of periganglionic origin and is poured into the subarachnoid space, but this amount is small. From these investigators we learn that the chief pathway of absorption is through the arachnoid villi into the superior longitudinal sinus. Dr. Elsberg has spoken of the obstructive form of hydrocephalus as being due to obstruction of the aqueduct of Sylvius. In a paper by Schlapp and Gere they state that they have examined a number of these cases and found an obstruction in the aqueduct of Sylvius which macroscopically consisted of tubercular-like swellings of the ependyma. We know that under the ependyma is a layer of glia which is of the same embryonic origin as that lining the spinal canal, the substantia gelatinosa centralis. It is simply the lining of the spinal canal and when degenerative changes occur in it we call these changes a central gliosis syringomyelia. Both of these processes have their origin in developmental changes, going back even to prenatal development, and it is my belief that similar changes occur in the glia of the iter and cause the obstruction described by Schlapp and Gere. The reason Dr. Elsberg gets some benefit from the procedure he has adopted in these cases may be that it allows more fluid to get into the subarachnoid space where it may be absorbed by the villi in the longitudinal sinus. It seems that the improvement that takes place must be accounted for on physiological grounds.

I want to call attention to a form of hydrocephalus of infectious origin and that is an internal hydrocephalus which may be due to a cerebrospinal meningitis which has led to a closure of the foramina of Magendie and Luschka. I believe in such cases we should operate for I do not think lumbar puncture will help them. I do not see why the pediatrician does not turn these cases over to the surgeon and as early as possible, so that an opening can be made in the thickened meninges over the foramina of Magendie. Here I agree with Dr. Sharpe that where we have a meningitic process the absorption through the arachnoid villi may be very poor.

There is one other point to which I wish to refer. Unquestionably there are cases of hydrocephalus in which no obstruction can be demonstrated by the physician and which are followed by early blindness and optic neuritis. These are generally of infectious origin and every effort should be made to preserve the eyesight by surgical procedures.

Dr. Godfrey R. Pisek.—Dr. Elsberg has put before us the subject of hydrocephalus on a scientific basis which is something we have needed. The pediatrician has long known that the only hope for the hydrocephalic lay in surgery and hence the various older plans that Dr. Elsberg has reviewed have been tried by him but always found wanting. Many of the methods of operating have failed and some caused death because they disturbed the heat centers, were followed by a rapid rise of temperature and a fatal ending. There is no doubt that by finding out the type of hydrocephalus by the various tests that may now be employed we will come to some type of operation that will benefit the patient. I have been impressed for a long time with the seeming groping in the dark in our treatment of hydrocephalus. We have felt obliged to resort to some method of treatment and have employed lumbar puncture, and some cases have apparently been cured by lumbar puncture. I have previously made the statement that a certain number of cases of hydrocephalus will respond to repeated lumbar puncture and now we will be able to decide upon the type of cases that will be helped by this procedure. Dr. Koplik has referred to the fact that apparently a certain number of cases are cured spontaneously and that this takes place at the time ossification occurs. I have taken the measurements of the head in many cases of hydrocephalus and have noticed that the increase in size only subsides when ossification begins. Dr. Elsberg did not speak of the mentality. It would seem that in order to get good results from the operation one should not only know the type of case but should take into consideration the mental status. To place the operation on a right plane it must be one that will improve not only the physical condition but the mental condition as well.

Dr. Elsberg (closing).—In the first place I excluded all the varieties of inflammatory hydrocephalus because they form an entirely different class of cases; their genesis and course is entirely different from that of hydrocephalus of the congenital type. I said nothing as to the cause of hypersecretion, obstruction or non-obstruction, but stated some of the facts brought out by recent investigations that have shown that there are three definite types of hydrocephalus; that due to obstruction, that due to diminished absorption and that due to hypersecretion. In eighteen out of forty cases diminished absorption from the arachnoid space was very marked and in such cases there is no reason for doing a puncture of the corpus callosum. The question that comes up here is how we may increase the absorptive power of the subarachnoid villi and that question we will take up at another time. The fact that we can expect no benefit from a puncture of the corpus callosum in a case of hydrocephalus due to diminished absorption is the reason why we must determine whether a given case is due to obstruction or to lack of absorption. If it is due to obstruction at the iter it may be benefited by puncture of the corpus callosum. When there is hypersecretion the only thing to be done is to relieve it by frequent punctures and to give thyroid which will diminish the amount of the secretion. If the hydrocephalus is due to a decreased absorption there is very little that we can do. I have devoted a great deal of time and study to hydrocephalus as seen in the living and at autopsy and it is only to bring out the point that we are now able to differentiate the different types of hydrocephalus that I have read this paper.

DR. GEORGE M. MACKEE gave a lantern slide demonstration showing the results of

X-RAY AND RADIUM IN THE TREATMENT OF SKIN DISEASES IN CHILDREN.

I am limited to a discussion of the results of the *x*-ray and radium in the treatment of dermatoses in infancy and childhood and this confines my remarks to very narrow limits as there are not very many skin diseases peculiar to infancy and not many more in children that are amenable to treatment by the *x*-ray and radium. One of the conditions frequently met with by the pediatrician and one in which Roentgenology has given good results is favus or ringworm. This is a condition that has given much trouble in different parts of the world. It is much more difficult to treat in early life than when it occurs near the time of puberty. It has been almost eradicated in London and in other European cities by the use of the *x*-ray, and it seems a pity that we have not employed this method more generally in the United States. Children with ringworm are not allowed to go to school but they mingle with others on the streets and are therefore a menace. As a result they never receive a school education. I believe Dr. Fordyce's clinic is the only free institution in this city where this method of treatment is being employed but every hospital and dispensary should be similarly equipped; it can be given by a nurse under supervision. It is possible where there is only a single lesion to treat merely the diseased area. It is not always necessary to depilate the entire scalp. When depilation occurs care must be taken that the hairs which fall out do not become scattered and spread the affection. To avoid this among intelligent people the lesion may be covered with zinc plaster after the treatment. As the hair falls out three weeks after the treatment, by removing the plaster at that time the hair will be found adherent to it. In the treatment of this condition by the *x*-ray the dosage must be very accurately measured. It takes a certain amount of *x*-ray to make the hair come out and a very little more to prevent its ever coming in again, so that the limits of the dosage are not very wide. We have treated 300 or more cases, three different men giving the treatment, and we have had no instance of permanent alopecia. It is evident that in applying the *x*-ray to the skull all points of the skull are not equally distant from the focus, and that the oblique rays will be less powerful than the direct rays. To overcome this discrepancy Adamson devised the method of mapping the skull into five areas and applying the *x*-ray to each of these successively. We have used no protection for the scalp, but have protected the face, ears and neck. It takes from one-half hour to forty-five minutes to treat the entire scalp and it is not necessary to treat all on the same day or to apply a full depilitating dose at one sitting; one may give a fractional part of the dose each day until the total dose is administered. If the correct dose is given the hair falls out in three weeks. There are a few contraindications. It cannot be used in very young children, but only because they cannot be kept still. A child of two or three years, however, may be treated very easily. The *x*-ray must not be applied to the scalp for three weeks after the application of irritating chemicals and such chemicals must not be used for several weeks after the *x*-ray has been employed. If the *x*-ray has been applied at such a time a permanent depilation may result. Sometimes it is not necessary to obtain complete depilation as the diseased hairs may fall out under very small doses, and if we only get a partial depilation of the affected area we will often effect a cure.

Blastomycosis and actinomycosis are conditions that respond well to *x*-ray treatment.

In vascular nevi we get good results with radium, but not so good with the *x*-ray. Cavernous angiomata can be cured by the *x*-ray, but only by persistent treatment, and such persistent treatment is not advisable. It is apparently the beta rays of the radium to which the therapeutic results probably can be attributed. These are also present in the *x*-ray but they cannot be used. The radium tube is not as satisfactory as the radium plaque because one gets a reticulate effect with the tube. The port-wine mark does not respond to *x*-ray or radium. Pigmented nevi do not do well under the *x*-ray or radium. Hairy nevi, on the other hand, respond well to the *x*-ray treatment.

Acne likewise responds to *x*-ray treatment but it is not necessary nor is it advisable to resort to this unless the ordinary methods fail.

Keloid occurs in infants and children usually as the result of burns and both *x*-ray and radium are very efficacious. All forms of keloid are amenable to such treatment.

Of the different varieties of warts, the common wart, verruca vulgaris, is very amenable to treatment by the *x*-ray or radium. One treatment with either one of these agents will usually effect a cure. The small flat juvenile warts do not do so well under this form of treatment. Plantar warts, keratomata, which are not very satisfactorily treated by other methods, respond to this form of treatment and I have never known a case to relapse.

Sarcoma in children is curable by this method if it is attacked sufficiently early. If a pigmented mole begins to develop into a sarcoma, it can be cured provided no metastasis has occurred. I have a picture of a case of melanosarcoma which was apparently cured by the *x*-ray five yeas ago. The patient had one relapse and was given further *x*-ray treatment, after which the cure appeared to be complete. I have had two or three other patients who have had no trouble after periods of three years.

In speaking of eczema I do not wish to be understood as advocating the use of the *x*-ray as a routine method of treatment, but in squamous eczema it causes the lesion to disappear and it requires only small doses to produce this result. I would, however, use the *x*-ray in eczema only in obstinate cases that failed to respond to the ordinary methods of treatment.

Psoriasis occurs frequently in children and is easy to treat by means of the *x*-ray and radium. Chrysarobin is, however, usually satisfactory. Radium and the *x*-ray are both effective but with radium one cannot treat as wide areas as with the *x*-ray.

Lichen planus is a recalcitrant disease but it usually responds to ordinary treatment. When it is limited to small areas the *x*-ray or radium is indicated.

Lupus vulgaris of hypertrophic or ulcerative type yields well to treatment with the *x*-ray or radium. The atrophic type is very recalcitrant. The *x*-ray, if properly administered, gives very good results in tuberculous adenitis. Scrofuladerma may also be treated in this way successfully.

DISCUSSION.

DR. FRED. WISE.—There is little opportunity for argument in this presentation, as there was on the subject of hydrocephalus, as this was largely an exhibit of the cases "before and after" treatment. In regard to the *x*-ray in the treatment of tinea favosa and ringworm, it may be said that if the *x*-ray had accomplished nothing else than to cure ringworm, it would be entitled to the greatest respect as a therapeutic agent; to cure ringworm in one-half hour, when by the older methods of treatment, even under the care of the best nurses and dermatologists, it took two and one-half years, is certainly an achievement worthy of note.

The case of actinomycosis which Dr. MacKee showed on the screen is fortunately not dead. He is thinking of another case, in a male patient. This girl was under the care of Dr. Steinke of Elizabeth and was well and had had no metastases, when I last saw her.

With regard to nevi, all pediatricians see these lesions and know that some nevi get well without treatment. When we get a case of nevus in the dispensary, the first question we ask is whether the lesion is getting larger or whether it is getting smaller. If it is not increasing in size we tell the mother to let it alone and return in a year; but this does not apply to the port-wine stain. Phenol or trichloracetic acid is sometimes as good as radium or the *x*-ray and perhaps better for port-wine stain, but the best treatment is CO_2 snow. I do not think that the speaker brought out that the treatment of these conditions by trichloracetic acid was satisfactory. Keloids, as the speaker said, are amenable only to *x*-ray treatment. I see as many as a dozen of these a month, resulting from scalds and burns, and the hypertrophic scars and contractures, especially in the axilla and elbow-joint causing a permanent disfigurement of the arm and difficulty in flexing the arm, can only be treated satisfactorily by the *x*-ray and radium.

The case of warts in the elbow flexure ought to be of interest to the pediatrician. This was the ordinary lichen simplex or lichen chronicus circumscriptus, an exanthematous eruption frequently limited to the neck, elbow, and knee flexures. Later on these peculiar warty formations develop at the site of the lichen in children.

I may mention that I have seen two cases of sarcoma that have been cured by the *x*-ray. As to psoriasis, I seldom have occasion to employ the *x*-ray. The lesions of lupus vulgaris and scrofuloderma are due to the presence of the tubercle bacilli in the skin and are difficult to cure. The Finsen light has been extensively used in Europe and the *x*-ray probably accomplishes more good in some tuberculous lesions than all other forms of therapeutic measures hitherto advocated.

In prurigo and chronic papular urticaria the etiology is obscure. It is difficult to cure these conditions. Occasionally divided doses of *x*-ray applied to the extremities will do more good than any form of dietetic treatment and I think these cases ought to be treated locally. I refer to the cases that do not get well under any form of dietetic treatment and where there is a deep-seated induration of lesions. Certain other skin diseases seen in children, such as xeroderma pigmentosum and other rare conditions have responded favorably to *x*-ray treatment.

DR. BOLESLAW LAPOWSKI.—In the first place I want to thank Dr. MacKee for what he has said in regard to the need for free dispensaries for the treatment of ringworm. Some time ago I went to Dr. Haven Emerson and presented the advantages of this method of treating ringworm and urged that the Health Department start a free clinic. Dr. Emerson said he approved of such a clinic but the finances of the Health Department would not permit this additional expense until after the war.

I have never treated cases of psoriasis with the *x*-ray. It is not a question of making the lesions disappear but the important point is what will follow. After treating psoriasis with the *x*-ray relapses may occur which are very resistant to treatment. The *x*-ray may have a place in the treatment of surgical diseases like sarcoma. Eczema is not a dermatitis and hence the logical treatment is not local but constitutional.

In the treatment of nevi, or indeed of any disease on a baby's body, I do not think we should draw conclusions as yet, for we may remove the primary lesion, but it may be followed by something worse later in life. At the present time perhaps the x-ray may be the only method we have that will remove these lesions.

Dr. MacKee, (closing).—I agree with Dr. Lapowski's insinuations to the effect that the x-ray might produce harmful results in after years. One speaker said that all röntgenologists were acquainted with the various complications and sequellæ of the x-ray and knew how they could be avoided. Radium and the x-ray should not be employed excepting by experts and they should not be used when other remedies sufficed to effect a cure. Dr. Lapowski opposed the use of the x-ray and radium in eczema and psoriasis because he thought these diseases were made more rebellious thereby. I have never encountered such a phenomenon but nevertheless these agents should not be employed in such diseases unless other methods failed.

REVIEW.

Diseases of Children. A Manual for Students and Practitioners. By George M. Tuttle, M. D., and Phelps G. Hurford, M. D. Third edition, thoroughly revised and enlarged. Pp. 599, illustrated with 47 engravings and 3 plates. Lea and Febiger. Philadelphia and New York, 1917.

The third edition of this manual of children's diseases shows a thorough and impartial study of recent pediatric literature and is a dispassionate presentation of what may be considered the views of the majority of writers. The work is simple, practical and sensible.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Pathology and Evolution of Diphtheria.—Danysr (*La Presse Médicale*, August 2) sums up an exhaustive article on this subject as follows: If we take for a basis the nature of the infection—the nature and the physicochemical and biological properties of the secretion of the diphtheria bacillus (formerly termed its antigen), along with the nature and physicochemical properties of the compounds which this antigen is able to form with its normal antibody and excess of antibody (antitoxins), we may define diphtheria as a local infectious disease, characterized by the formation of a colloidal antigen, soluble, directly toxic, nitrous incubation period and possessing a special affinity for the cells of ectodermic origin. The normal antibody is of intracellular origin and is able to fix the antigen in excess. The antigen forms soluble compounds with soluble antibodies. The intracellular reactions are as follows: there is immunity for the cells and for the organism as a whole if the quantities of antigen and antibody are equal, or if there is an excess of antibody; but the reaction is more or less pathogenic if there is an excess of antigen and fixation of the latter by cellular antibody in excess.

INDEX.

A

- Abdominal pregnancy, removal of sac one year after spurious labor. Caturani........ 135
- Abortion, a statistical study of the causes of. Royston........ 571
  - early uterine, by corpus luteum and retention cysts of the ovary. Rubin........ 345
  - infectious, of cattle as a complication of pregnancy of women. De Forest........ 221, 320
  - previous incomplete, pregnancy at the site of. Mack........ 118
  - septic infection following. Schwartz........ 852
- Abscess, appendicular, treatment of. Sellman........ 950, 1002
- Abt. A case of appendicitis in a nine months' old baby, with autopsy record........ 533
  - A case of pneumothorax in a twelve-year-old boy........ 534
  - Congenital skin defects........ 365
  - The technic of wet-nurse management in institutions........ 540
- Accouchement forcé in placenta previa, the *pros* and *cons* of. Tallant...46, 80
- Acid, uric, content of the blood in new-borns. Sedgwick and Kingsbury.. 360
- Acidosis in children. Lackner and Gauss........ 870
  - occurrence of, with severe diarrhea. Schloss and Stetson........ 871
- Adenitis, cervical, the relation of the nose and throat to. Wood........ 174
- Adenomyoma of the ovary. Rabinovitz........ 67, 142
  - of the rectovaginal septum. Cullen........ 517
- Adrenal bodies, the experimental and clinical evidence as to the influence exerted by the, upon the genital system. Vincent........ 681
- Amaurotic family idiocy. Welt-Kakels........ 1032
- American Pediatric Society, the responsibility of the, in the present national crisis. Churchill........ 349
- Analgesia, nitrous oxide-oxygen, in obstetrics. Copeland........ 858
  - nitrous oxide, in obstetrics. Danforth........ 563
- Anemia, secondary, the treatment of, in infants by blood transfusion. Kerley........ 713
- Anesthesia, nitrous oxide-oxygen, in obstetrics. Copeland........ 858
- Antepartum mammary hyperemia due to unrecognized malignant disease. Kosmak........ 444, 493
- Anterior poliomyelitis, diagnosis and serum treatment of. Zingher........ 865
- Antipoliomyelitic serum, production of. Nuzunc........ 378
- Antitryptic power of blood serum in the pregnant woman. Ecalle........ 856
- Appendicitis in a nine months' old baby, with autopsy record. Abt........ 533
  - left-sided, in *situs inversus viscerum totalis*. Jacobson........ 953, 1002

Appendicular abscess, treatment of. Sellman.....950, 1002
Application for appointment in the Medical Reserve Corps, United States Army..... 338
Arnold. The treatment of placenta previa.....38, 80
Astragalectomy in infantile paralysis. Mac Ausland..... 377
Atony, intestinal, in children. Turck..... 159
Aural complications of the exanthemata. Lynah..... 191
Autopsy findings, the value of the von Pirquet test as controlled by. Knox, Jr..... 714
Ayer. The early diagnosis of poliomyelitis..... 168
Ayres. Some observations on the after-results of the interposition operation.....451, 493

B

Bacillary dysentery, epidemiology of. Smillie..... 872
Bacillus aborticus, observations on the presence of the, in certified milk. Fleischner and Myers..... 551
  carriers, diphtheria, treatment of. Bell..... 208
Bacteriology and probable means of spread of poliomyelitis. Greeley.... 866
  of the feces in diarrhea of infants. Logan..... 208
Bacteriuria and pyuria, relation of, to intestinal disturbances in children. Neff..... 731
Bailey. Radium in uterine cancer..... 514
  Relation of the sex glands to metabolism..... 684
Bandler. The ductless glands in gynecology..... 644
  The ductless glands in obstetrics and gynecology..... 1008
Barnard. Retained placenta.....308, 477
Bartlett. The salts in green vegetables and the effect of different modes of cooking..... 362
Bartley. Defective nutrition in early life..... 171
Beach. Methods of treatment of placenta previa.....57, 103
Beever. Focal lesions produced in the rabbit by colon bacilli isolated from pyelitis cases..... 369
Bernstein. Various phases of feeblemindedness and the stigmata of degeneration, physical types, etc..... 181
Bilateral oöphorectomy in a gravida; labor at term. Stropeni..... 694
Birth, injuries at, premature births and stillbirths. Miller.....615, 674
  -weight, average, in 2000 confinements in the state of Maine. Warren..... 932
Bissell. A vaginal subtotal hysterectomy technic, equally applicable to cases with or without procidentia uteri or cystocele..... 687
Bladder, exstrophy of the. Stevens..... 372
  method of supporting, in certain cases of cystocele. Smith..... 346
Blood calcium, studies on. Cowie..... 359
  loss from menstruation. Lahille..... 697
  maternal and fetal, during pregnancy and the puerperium. Fullerton..... 918
  nonprotein nitrogen of the, in infants. Minsk and Sauer..... 875
  pressure, clinical study of. Polak..... 691

Blood serum, antitryptic power of, in the pregnant woman. Ecalle..... 856
serum, the therapeutic use of. Freeman........................ 354
-sugar, obstetrical significance of, with special reference to placental interchange. Morriss.................................. 341
the uric acid content of the, in new-borns. Sedgwick and Kingsbury. 360
transfusion, the treatment of secondary anemia in infants by. Kerley.. 713
Boarding out *vs.* institution care for infants and young children. Chapin. 196
Body posture, the effect of, on the position and emptying time of the stomach. De Buys and Henriques................................ 698
Bonifield. Prolapse of the uterus.............................750, 830
Bovine infection of tuberculosis in children. Wang....................... 869
Boyd. Cesarean section in placenta previa..........................26, 80
Brain, sarcoma of the, simulating hydrocephalus. Holt................ 537
Branham. Gall-bladder surgery.................................940, 994
Breast feeding, the institution, reëstablishment and maintenance of. Sedgwick... 539
Brettauer. Lymphosarcoma of the cecum.......................... 90
Brodhead. The treatment of eclampsia........................... 112
Brown. A cystoscopic study of the end results of various forms of cystocele operations... 686
Butterworth. Luetic nephritis in infancy and childhood............... 720
Butyric dyspepsia, mucous gastritis and pylorospasm in the nursling. Chevrel.. 866

C

Calcium partition of distribution in ox blood and in man's blood. Cowie... 359
Calculus, ureteral. Judd...................................... 853
Call of the hour. Kosmak...................................... 335
Cancer, inoperable uterine, treatment of, by heat. Percy............. 993
of the uterus, radium therapy in. Recasens....................... 859
uterine, radium in. Bailey.................................... 314
Carcinoma, inoperable, of the cervix, palliative treatment of, by radium. Frank... 342
occurring in the stump of the cervix following suprapubic hysterectomy. Vander Veer...................................771, 842
of the cervix, recurrences after "five-year period" in. Werder..776, 842
primary, of the liver in childhood. Crozer....................... 350
primary, of the liver in childhood, with report of a case. Forman and Hattery... 862
uterine, types of. Zimmermann................................ 107
vulvar, etiologic study of. Taussig..........................516, 794
Carcinomatous ovarian teratoma with premature puberty and precocious development. Harris.. 696
Cardiac compensation, failing, during pregancncy. Lawrence............ 346
dilatation, postoperative, clinical study of. Polak................ 691
Care, boarding out *vs.* institution, for infants and young children. Chapin. 196
of sick children in the home. Wald............................. 200

Care of the city's dependent children. Kingsbury.................... 198

Carlson. The endocrine function of the pancreas and its relation to the sex life of women.. 680

Carr. Contribution to poliomyelitis................................... 728

Carstens. Gall-bladder trouble complicating disease of the internal genitalia..936, 994

Cartin. Intubation of the larynx..................................... 705

Caturani. Abdominal pregnancy, removal of sac one year after spurious labor.. 135

 Pseudohermaphroditism. Testicle in a woman.................. 136

Cecum, lymphosarcoma of the. Brettauer............................ 90

Cerebrospinal fluid, colloidal gold reaction of, in acute poliomyelitis. Felton, and Maxcy... 732

 fluid in poliomyelitis. Jeans and Johnston....................... 732

Cervical adenitis, the relation of the nose and throat to. Wood........... 174

 glands, enlarged, *x*-ray treatment of. Phaler..................... 177

 lacerations; their significance for the patient. Reder.......... 756, 837

 lymph glands, enlarged, indications for removal of. Dowd........ 178

 lymph nodes, differential diagnosis of enlargements of the. Haynes. 172

 lymphadenitis due to infections arising in and about the teeth. Hartzell... 175

 repair following confinement. Coffey............................ 282

Cervicoplastic treatment of sterility. Sturmdorf...................... 469

Cervix, carcinoma occurring in the stump of the, following suprapubic hysterectomy. Vander Veer................................771, 842

 carcinoma of the. Werder....................................776, 842

 palliative treatment of inoperable carcinoma of the, by radium. Frank.. 342

Cesarean scar, the, an anatomical study. Losee....................... 1

 section, a case of, in a primipara followed in the next pregnancy by a normal delivery. Warner.................................... 598

 section, an histological study of fifty uteri removed at. Williams.. 326

 section, extraperitoneal, description of a simple method of performing. Cherry... 560

 section in placenta previa. Boyd..............................26, 80

Chapin. A comparison between clinical examination and Röntgenograms in diseases of the chest..................................... 704

 Systematic boarding out *vs.* institution care for infants and young children.. 196

Cherry. Description of a simple method of performing extraperitoneal Cesarean section.. 560

 Instrument for making internal measurements through the rectum... 132

Chest, comparison between clinical examination and Röntgenograms in diseases of the. Chapin...................................... 704

Child. Postoperative treatment of vesicovaginal fistulæ..............455, 495

 Prenatal care..631, 674

Childbirth, mortality from. Kosmak................................. 1016

Children, city's dependent, the care of. Kinsbury..................... 198

 sick, the care of, in the home. Wald............................ 200

Chloride, sodium, excretion of, injected subcutaneously. Holt, Courtney and Fales........ 375
Chloroform, ether and nitrous oxid-oxygen in pregnancy and labor. Davis. 557
    poisoning. Spencer........ 898
Cholecystectomy, indications for. Lund........ 347
Chorioepithelioma following a hydatid mole. Jellinghaus........ 141
Churchill. The responsibility of the American Pediatric Society in the present national crisis........ 349
Chylothorax in an infant. Pisek........ 537
Cinematograph demonstration of the operation for the cure of complete perineal laceration. Ill........ 827
City's dependent children, care of the. Kingsbury........ 198
Clark. Radiotherapy in urine hemorrhage of benign origin........ 514
Closure and filiform drainage of the pelvis. Chaput........ 347
Clothing, the weight of the, in the first five years of life. Griffith........ 708
Coagulation of cow's milk in the human stomach. Brennemann........ 555
Cod-liver oil, the effect of, in intestinal infantilism. Holt........ 721
Coffey. Cervical repair following confinement........ 282
Colloidal gold reaction of cerebrospinal fluid in acute poliomyelitis. Felton and Maxcy........ 732
Colon bacilli, focal lesions produced in the rabbit by, isolated from pyelitis cases. Helmholz and Beever........ 369
    giant, case of a. Noble........946, 1001
    skiagram of a case of idiopathic dilatation of the. Crozer........ 524
Condylar fragment, fractures of the external condyle of the humerus in childhood, with rotation of the. Stone........ 730
Condyle, external, of the humerus, fractures of the, in childhood, with rotation of the condylar fragment. Stone........ 730
Confinement, cervical repair following. Coffey........ 282
Congenital heart disease, a case of. Hunter........ 529
    skin defects. Abt........ 365
Cord, short, dystocia due to. Kosmak........ 318
Cornell. Psychology *vs.* psychiatry in diagnosing feeblemindedness...... 188
Coroner's office, obstetric problems and the. Wadsworth........622, 674
Corpus luteum and retention cysts of the ovary, simulation of ectopic pregnancy and early uterine abortion by. Rubin........ 345
Cowie. Hereditary multiple exostoses........ 535
    Studies on blood calcum. The calcum partition of distribution in blood and in man's blood........ 359
Cragin. The value of the avoidance of shock and trauma in the treatment of eclampsia........211, 332
Creatinine and creatine in the whole blood and plasma of mother and fetus placental transmission. Plass........ 341
Cretinism, sporadic, three children with, in one family. Herrman........ 525
Crozer. Primary carcinoma of the liver in childhood........ 350
    Skiagram of a case of idiopathic dilatation of the colon........ 524
Cullen. Adenomyoma of the rectovaginal septum........ 517
Cyst of the urachus. Chavannaz........ 1022
    ovarian, postpartum complicated by mechanical ileus. Ronsheim... 851
Cysts, papillomatous, of the ovary. Schwartz........ 855

Cystocele and uterine prolapse, treatment of, during the child-bearing period. Watkins........ 687
  method of supporting the bladder in certain cases of. Smith........ 346
  operations, a cystoscopic study of the end results of various forms of. Broun and Rawls........ 686
Cystoscopic study of the end results of various forms of cystocele operations. Broun and Rawls........ 686

D

Danforth. Nitrous-oxide analgesia in obstetrics........ 563
Darnall. Mixed cell tumor of the kidney weighing three pounds in an infant ten months old........786. 849
Davis. A study of chloroform, ether and nitrous oxid-oxygen in pregnancy and labor........ 557
Death, fetal, some causes of. Pfeiffer........74, 121
De Buys. The effect of body posture on the position and emptying time of the stomach........ 698
D'Espine sign in tuberculosis in children. Bloom........ 876
De Forest. Infectious abortion of cattle as a complication of pregnancy in women........221, 320
Degeneration, stigmata of. Bernstein........ 181
De Lee. Several every-day obstetric problems........15, 91
Depopulation and repopulation of France, cause of the, from the medical viewpoint. Jayle........ 1021
Diarrhea in infants, bacteriology of the feces in. Logan........ 208
  infectious, hematology of. Bloom........ 380
  severe, occurrence of acidosis with. Schloss and Stetson........ 871
Diarrheal conditions found in California. Lucas........ 701
Dickinson. Fundal hysterectomy to reduce the menstruating surface..740, 819
  The treatment of rebellious trachelitis........ 115
Diets containing various forms and quantities of protein, the effect on human milk production of. Hoobler........ 717
Dilatation, acute, of the uterus. Scott........763, 838
Diphtheria bacillus carriers, treatment of. Bell........ 208
  carriers. Rabinoff........ 372
  isolated nasal. Rolleston........ 871
  pathology and evolution of. Danysr........ 1044
Dowd. Indications for removal of enlarged cervical lymph glands........ 178
Draft, proposed selective, for physicians. Kosmak........ 491
Drainage, filiform, of the pelvis. Chaput........ 347
Dubois abscesses, syphilitic disease of the thymus in infants and mode of origin of. Oliver........ 555
Ductless glands in gynecology. Bandler........ 644
  glands in obstetrics and gynecology. Bandler........ 1008
Duke's disease, the fourth. Lesage........ 866
Dunn. Intravenous injections in infancy........ 352
Dysentery, bacillary, epidemiology of. Smillie........ 872
Dysmenorrhea, ovarian, use of x-rays in certain forms of. Hernaman-Johnson........ 1022

Dyspepsia, butyric, mucous gastritis and pylorospasm in the nursling. Chevrel........ 866
Dystocia due to short cord. Kosmak........ 318
  fetal, as an indication for operative delivery. McGlinn........ 977

E

Eclampsia complicated by accidental hemorrhage and flat pelvis, postoperative pulmonary edema, intestinal paresis and lochiometra. Pfeiffer........ 111
  kidney in. Dorland........ 340
  the treatment of. Brodhead........ 112
  the value of the avoidance of shock and trauma in the treatment of. Cragin........ 211, 332
  Young........ 340
Economic hints from France. Merrill........ 405
Economics of the hospital, surgeon's responsibility to the. Marvel........ 482
Ectopic gestation, fibromyoma uteri with. Hussey........ 109
  pregnancy. Oastler........ 148
  pregnancy, transplantation of, from fallopian tube to cavity of uterus. Wallace........ 857
Edebohls' operation in nephritis in childhood. Morse........ 709
Edema, postoperative pulmonary, eclampsia complicated by. Pfeiffer........ 111
Elizabeth Steel Magee hospital of Pittsburgh. Ziegler........ 225, 320
Elsberg. Chronic internal hydrocephalus. The newer methods for its recognition and treatment........ 1033
Emmons. Prenatal care—an opportunity for the medical profession.. 401, 503
Endocarditis, acute, immediate tonsillectomy in. Fleischner........ 380
Endocrine function of the pancreas and its relation to the sex life of women. Carlson........ 680
Endometritis and septicemia, acute, following parturition. Graves........ 458
Enuresis, nocturnal, treatment of, by suggestion. Dunham........ 372
Epidemiology of bacillary dysentery. Smillie........ 872
Epstein. The minor neuroses of childhood........ 1027
Erodium cicutuarium, a hemostatic in uterine hemorrhages. Van Dongen. 857
Erysipelas and its sequelæ, the incidence of a case of. Humpstone........ 123
Ether, chloroform, and nitrous oxid-oxygen, a study of, in pregnancy and labor. Davis........ 557
Eye-ground examination, importance of, in infants after difficult delivery. Kearney........ 904
Exanthemata, the aural complications of the. Lynah........ 191
Exostoses, hereditary multiple. Cowie........ 535
Exstrophy of the bladder. Stevens........ 372
Extraperitoneal Cesarean section, description of a simple method of performing. Cherry........ 560
Extrauterine pregnancy, advanced, with living child. Lee........ 147

F

Fallopian tube, left, and intestinal stasis. Stewart........ 943, 1001
Fascia transplantation into visceral defects. Neuhof........ 343

Fat incapacity, a familial tendency to, in infancy and childhood. Southworth........ 548
Fatty tumors of the uterus. Elkin and Haythorn........ 859
Feces, bacteriology of the, in diarrhea of infants. Logan........ 208
Feeblemindedness and the stigmata of degeneration, physical types, etc., various phases of. Bernstein........ 181
    psychology *vs.* psychiatry in diagnosing. Cornell........ 188
Feeding, breast, the institution, reëstablishment and maintenance of. Sedgwick........ 539
    infant, vitamines in. Fischer........ 699
    practical infant. Johnson........ 151
Female generative organs, the relation of the pituitary gland to the. Goetsch........ 677
    genital apparatus, the relation of the parathyroid system to the. Pool........ 679
    genital tract, the possible bearing of the thymus gland upon the. Pappenheimer........ 680
    sex glands, interrelationship of, and the pituitary body. King. 964, 1010
Fetal death, some causes of. Pfeiffer........ 74, 121
    dystocia as an indication for operative delivery. McGlinn........ 977
    maturity in utero. Reed........ 860
Fetus, diagnosis of the age of the, by Röntgenograms. Hess........ 710
Fibroid tumors, radium in the treatment of. Miller........ 513
    uterine, Röntgentherapy successful in, without affecting the ovaries Pfahler and McGlinn........ 262, 317
Fibroids, pregnancy complicating. Robertson........ 130
    uterine, with reference to their tendency to become sarcomatous. Warner........ 888
Fibromyoma uteri with ectopic gestation. Hussey........ 109
Filiform drainage of the pelvis. Chaput........ 347
Fischer. Recent literature pertaining to vitamines: their application in infant feeding........ 699
Fissures, pulmonary, and lobes, topography of, in infants. Gittings, Fetterolf and Mitchell........ 373
Fistulæ, vesicovaginal, postoperative treatment of. Child........ 455, 495
Fleischner. Observations on the presence of the bacillus aborticus in certified milk........ 551
Flora, intestinal, experimental studies of. Sisson........ 379
Fluid, spinal, of children, chemistry of the. Leopold and Bernhard........ 376
Focal lesions produced in the rabbit by colon bacilli isolated from pyelitis cases. Helmholz and Beever........ 369
Food idiosyncrasies, rôle of, in practice. Talbot........ 165
Foote. A case of pellagra in a child residing in the District of Columbia.. 1023
Ford. Procidentia in the nulliparous woman........ 438, 498
Forman. Primary carcinoma of the liver in childhood, with report of a case........ 862
Fractures of the external condyle of the humerus in childhood, with rotation of the condylar fragment. Stone........ 730
Fragilitas ossium and its association with blue sclerotics and otosclerosis. Bronson........ 873

France, some economic hints from. Merrill........................... 405
Frank. Symposium on the relation of the glands of internal secretion to gynecology and obstetrics................................. 677
  The placenta regarded as a gland of internal secretion............ 683
Freeland, James Roy, in memoriam. Schildecker...................... 818
Freeman. The therapeutic use of blood serum........................ 354
Friedländer. Enlargement of the thymus treated by the x-ray.......... 366
Fullerton. Maternal and fetal blood during pregnancy and the puerperium.. 918
Fundal hysterectomy to reduce the menstruating surface. Dickinson.. 740, 819

G

Gall-bladder, effect of removal of the. Judd and Mann................ 346
  -bladder surgery. Branham............................ 940, 994
  -bladder trouble complicating disease of the internal genitalia. Carstens... 936, 994
  -stones, the diagnosis and treatment of. Vaughan............... 982
Garnett. A new method of treating pernicious vomiting of pregnancy.... 303
Gas-bacillus infection. Graves...................................... 458
Gastritis, mucous, in the nursling. Chevrel.......................... 866
Gastrointestinal conditions in women. Reed........................... 517
Gellhorn. Unilateral defect of tube and ovary, a study in prenatal pathology.. 877
Generation, diagnosis, treatment and management of surgical conditions complicating the process of. Hirst.......................... 971
Generative organs, female, the relation of the pituitary gland to the. Goetsch.. 677
Genital apparatus, female, the relation of the parathyroid system to the. Pool.. 679
  canal, the intermediate repair of the injuries of the, in childbirth. Hirst.. 50, 98
  system, the influence exerted by adrenal bodies upon the. Vincent. 681
  tract, female, the possible bearing of the thymus gland upon the. Pappenheimer.. 680
  tract, pregnancy and labor following operative procedures on the. Ronsheim.. 289
Genitalia, internal, gall-bladder trouble complicating disease of the.. Carstens... 936, 994
Gerstenberger. A pathogenesis of infantile scurvy—A hypothesis....... 727
Gestation, Grippe and. Chomé.. 695
Giant colon, a case of. Noble................................. 946, 1001
Gittings. Phenolsulphonephthalein elimination in infants and children... 711
Gland of internal secretion, the placenta regarded as a. Frank.......... 683
  parathyroid, the physiological and pathological importance of the. Voegtlin.. 678
  thymus, the possible bearing of the, upon the female genital tract. Pappenheimer.. 680
  thyroid, in relation to gynecology and obstetrics. Marine........ 680

Glands, ductless, in gynecology. Bandler........................... 644
    ductless, in obstetrics and gynecology. Bandler.................. 1008
    enlarged cervical lymph, indications for removal of. Dowd........ 178
    enlarged cervical, *x*-ray treatment of. Phaler.................... 177
    of internal secretion, symposium on the relation of the, to gynecology and obstetrics. Frank.................................... 677
    sex, relation of, to metabolism. Murlin and Bailey............... 684
Glinn. Some gynecological weaknesses.................................. 126
Goetsch. The relation of the pituitary gland to the female generative organs; from the experimental and clinical aspects............. 677
Graves. Gas bacillus infection; report of a case of acute endometritis and septicemia following parturition; discussion; researches in war zone... 458
    Transplantation and retention of ovarian tissue after hysterectomy. 683
Griffin. Report of a case of acute inversion of the uterus following parturition.. 639
Griffith. The weight of the clothing in the first five years of life........ 708
Grippe and gestation. Chomé.. 695
Grulee. Rumination in the first year of life.......................... 552
Gynecological weaknesses. Glinn..................................... 126
Gynecology and obstetrics, symposium on the glands of internal secretion to. Frank.. 677
    and obstetrics, the thyroid gland in relation to. Marine......... 680
    its problems. Simpson.. 329
    radiotherapy in. Keene... 696
    the ductless glands in. Bandler.................................. 644

H

Hartzell. Cervical lymphadenitis due to infections arising in and about the teeth... 174
Hattery. Primary carcinoma of the liver in childhood, with report of a case 862
Hayd. The thyroid in gynecology..................................958, 1010
Haynes. The differential diagnosis of enlargements of the cervical lymph nodes.. 172
Heart disease, congenital, a case of. Hunter........................... 529
Hedges. Physical conditions in women warranting sterilization......745, 822
Heiman. Clinical observations on poliomyelitis during the 1916 epidemic; prophylaxis; description of a characteristic sign................. 724
Heineberg. Uteroscopy *vs.* transperitoneal hysterotomy................ 216
Helmholz. Focal lesions produced in the rabbit colon bacilli isolated from pyelitis cases.. 369
Hematocolpox, hematometra, and bilateral hematosalpinx. Schwartz... 119
Hematology of infectious diarrhea. Bloom............................. 380
Hematometra, and bilateral hematosalpinx. Schwartz.................. 119
Hemogenic salpingitis, chronic. Danforth.............................. 346
Hemoglobin in postoperative shock, clinical study of. Polak........... 691
Hemorrhage, accidental, and flat pelvis, eclampsia complicated by. Pfeiffer.. 111
    postoperative, clinical study of. Polak............................ 691

Hemorrhage, uterine, of benign origin, radiotherapy in. Clark.......... 514
uterine, radium in the treatment of. Miller.................... 513
uterine, radium treatment of. Kelly......................... 513
Hemorrhagic abdominal sinus. Warren........................... 134
Hemorrhagic disease in the new-born treated by direct transfusion. Knox. 523
Henriques. The effect of body posture on the position and emptying time of the stomach.. 698
Hereditary multiple exostoses. Cowie............................ 535
Hernia, vaginal, and its treatment. Hartmann...................... 347
Herrick. Mentality and intelligence tests......................... 183
Herrman. Three children with sporadic cretinism in one family......... 525
Hess. Diagnosis of the age of the fetus by Röntgenograms............ 710
Heyd. Obstructive jaundice.................................... 409
Hirst. The diagnosis, treatment and management of surgical conditions complicating the process of generation....................... 971
The intermediate repair of the injuries of the genital canal in childbirth. Hirst...50, 98
Holden. Are dilatation, vaginal plastic operations or stem pessaries worth while as an exclusive treatment for sterility? Illustrative cases. 64, 87
Holt. Sarcoma of the brain simulating hydrocephalus................ 537
The effect of cod-liver oil in intestinal infantilism............... 721
Hoobler. Problems connected with the production and collection of human milk.. 544
The effect on human milk production of diets containing various forms and quantities of protein.............................. 717
Hospital, the surgeon's responsibility to the economics of the. Marvel.. 482
Human milk, problems connected with the producion and collection of. Hoobler.. 544
Humpstone. The incidence of a case of erysipelas and its sequelæ....... 123
Hunner. Ureteral stricture; report of one hundred cases.............. 685
Hunter. A case of congenital heart disease...................... 529
The McDonald solution...................................... 986
Huntington. The true value of certain pelvic measurements........... 277
Hussey. Fibromyoma uteri with ectopic gestation.................... 109
Hydrocephalus, chronic internal. Elsberg......................... 1033
internal, some aspects of. Wolf............................ 150
sarcoma of the brain simulating. Holt........................ 537
Hyperemia, antepartum mammary, due to unrecognized malignant disease. Kosmak.. 444, 493
Hypertension in nephritis in childhood. Berkley and Lee.............. 872
Hysterectomy, fundal, to reduce the menstruating surface. Dickinson. 740, 819
suprapubic, carcinoma occurring in the stump of the cervix. Vander Veer...771, 842
the operation of choice to terminate pregnancy, when subsequent pregnancy is to be avoided. Marvel........................271, 315
total, the technic of, for nonmalignant conditions. Worrall...... 894
Hysterectomy, transplantation and retention of ovarian tissue after. Graves... 683
Hysterotomy, transperitoneal, uteroscopy *vs.* Heineberg............... 216

I

Idiocy, amaurotic family. Welt-Kakels.......... 1032
Idiopathic dilatation of the colon, skiagram of a case of. Crozer.......... 524
Ileus, mechanical, ovarian cyst postpartum complicated by. Ronsheim.. 851
Ill. Cinematograph demonstration of the operation for the cure of complete perineal laceration.......... 827
Immobilization, operative, of the spine. DeQuervain and Hoessly...... 874
Indicanuria in children. McClanahan.......... 722
  in children. Schuyler.......... 155
Infant feeding, practical. Johnson.......... 151
  feeding, vitamines in. Fischer.......... 699
Infantile paralysis, a case of double obliquely contracted pelvis (Roberts), associated with acute lumbar lordosis due to, in early childhood. Lazard.......... 585
  paralysis, astragalectomy in. MacAusland.......... 377
  paralysis, recent epidemic of. Emerson.......... 867
  scurvy, a pathogenesis of. Gerstenberger.......... 727
  scurvy, subacute and latent. Hess.......... 377
  scurvy: Therapeutic value of yeast and of wheat embryo. Hess.. 376
Infantilism, intestinal, the effect of cod-liver oil in. Holt.......... 721
Infection, milk-borne, in the transmission of human communicable diseases. Kelley.......... 375
  septic, following abortion. Schwartz.......... 852
Infections, nasopharyngeal, and tonsillar, relation of, to general systemic disorders. Crowe, Watkins, and Rothholz.......... 378
Injections, intravenous, in infancy. Dunn.......... 352
Injuries at birth, premature births and stillbirths. Miller..........615, 674
  of parturition, the immediate repair of the. Pool..........53, 98
  of the genital canal in childbirth, the intermediate repair of the. Hirst..........50, 98
Insurance, maternity. Lehrfeld..........636, 674
Intelligence tests, mentality and. Herrick.......... 183
Internal secretion, the placenta regarded as a gland of. Frank.......... 683
Interposition operation, some observations on the after-results of the. Ayres..........451, 493
Intestinal atomy, the mechanism of, in children; etiology and treatment. Turck.......... 159
  disturbances, relation of bacteriuria and pyuria to, in children. Neff.......... 731
  flora, experimental studies of. Sisson.......... 379
  infantilism, the effect of cod-liver oil in. Holt.......... 721
  stasis, left Fallopian tube and. Stewart..........943, 1001
Intravenous injections in infancy. Dunn.......... 352
Intubation of the larynx. Cartin.......... 705
Inversion, acute, of the uterus, report of a case of, following parturition. Griffin.......... 639

J

Jacobson. Left-sided appendicitis in *situs inversus viscerum totalis*....953, 1002
Jaundice, obstructive. Heyd.......... 409

Jellinghaus. Chorioepithelioma following a hydatid mole 141
Johnson. Practical infant feeding 151
Jones. Operative treatment of procidentia 752, 830
Judd. Ureteral calculus 853
Juvenile psychoses, types of. Millias 188

K

Kearney. The importance of an eye-ground examination in infants after difficult delivery with or without the aid of instruments 904
Keefe. President's address, thirtieth annual meeting American Association of Obstetricians and Gynecologists 733, 819
Kelly. Radium treatment of uterine hemorrhage due to other causes than malignancy 513
Kerley. Accidents in foreign protein administration 531
  The treatment of secondary anemia in infants by blood transfusion. 713
Kidney in eclampsia. Dorland 340
  mixed cell tumor of the, weighing three pounds in an infant ten months old. Darnall 786, 849
King. Interrelationship of female sex glands and the pituitary body ..964, 1010
Kingsbury. The care of the city's dependent children 198
  The uric acid content of the blood in new-borns 360
Knox. A case of hemorrhagic disease in the new-born treated by direct transfusion 523
  The value of the von Pirquet test as controlled by autopsy findings ... 714
Kosmak. Dystocia due to short cord 318
  In memory of Brooks Hughes Wells 210
  Prenatal care—a national question 489
  Report of a case of antepartum mammary hyperemia due to unrecognized malignant disease 444, 493
  The call of the hour 335
  The mortality from childbirth 1016
  The proposed selective draft for physicians 491
Krusen. Puerperal septicemia 605, 674

L

Labor, and pregnancy, following operative procedures on the genital tract. Ronsheim 289
  at term. Stropeni 694
  small doses of pituitrin for inducing and shortening labor at term. Stein and Dover 1021
  spurious, abdominal pregnancy, removal of a sac one year after. Caturani 135
  status of pituitary extract in. Trundell 858
Lacerations, cervical; their significance for the patient. Reder 756, 837
Lactic acid bacilli milk, the use of. McClanahan 547
Larynx, intubation of the. Cartin 705
Lazard. A case of double obliquely contracted pelvis (Roberts), associated with acute lumbar lordosis due to infantile paralysis in early childhood 585
  Indications in obstetric surgery 909

Leavitt. Pyelitis during pregnancy.......... 297
Lehrfeld. Maternity insurance..............................636, 674
Leukemia, acute, infective theory of. Ward........................ 871
Leukocytes, degeneration of, in the urine as a diagnostic aid in tuberculosis of the urinary tract in women. Wynne........................ 859
Lipodystrophia progressiva. Weber............................. 875
Liver necrosis, influence of oxygen on. Spencer...................... 898
  primary carcinoma of the, in childhood. Crozer................. 350
  primary carcinoma of the, in childhood. Forman and Hattery.... 862
  toxemia of pregnancy simulating acute yellow atrophy of the. Polak.. 125
Lobenstine. The development of prenatal care in the Borough of Manhattan, New York City..............................381, 503
Lobes, topography of pulmonary, in infants. Gittings, Fetterolf and Mitchell.. 373
Loeb. The relation of the ovary to the uterus and the mammary gland from the experimental aspect............................... 681
Longitudinal sinus a site for obtaining blood and for transfusion. Tarr... 870
Losee. The Cesarean scar, an anatomical study...................... 1
Lucas. A case of precocious menstruation............................ 522
  A study of the diarrheal conditions found in California.............. 701
Luetic nephritis in infancy and childhood. Butterworth................ 720
Lumbar lordosis due to infantile paralysis in early childhood. Lazard.... 585
Lymph glands, enlarged cervical, indications for removal of. Dowd........ 178
  nodes, cervical, the differential diagnosis of enlargements of the. Haynes.. 172
Lymphadenitis, cervical, due to infections arising in and about the teeth. Hartzell.. 175
Lymphosarcoma of the cecum. Brettauer........................... 90
Lynah. The aural complications of the exanthemata................... 191

M

McClanahan. Indicanuria in children............................ 722
  The use of lactic acid bacilli milk............................ 547
McCord. The pineal gland influence upon growth and differentiation, with particular reference to its influence upon prenatal development..... 678
McDonald solution. White and Hunter............................. 986
McGlinn. Fetal dystocia as an indication for operative delivery. The relative propriety of such procedures as they affect the interests of mother and infant.. 977
  Röntgentherapy successful in uterine fibroid without affecting the ovaries..262, 317
MacKee. X-ray and radium in the treatment of skin diseases in children. . 1040
Mack. Pregnancy at the site of previous incomplete abortion.............. 118
Mammary gland and the uterus, the relation of the ovary to the, from the experimental aspect. Loeb............................... 681
  hyperemia, antepartum, due to unrecognized malignant disease. Kosmak..444, 493
Marine. The thyroid gland in relation to gynecology and obstetrics....... 680

Marvel. Hysterectomy—the operation of choice to terminate pregnancy, when subsequent pregnancy is to be avoided.................271, 315
The surgeon's responsibility to the economics of the hospital........ 482
Maternal and fetal blood during pregnancy and the puerperium. Fullerton. 918
mortality from childbirth in the United States and its relation to prenatal care. Meigs..................................392, 504
nursing, restoration of, after sixteen days of complete interruption. Southworth.. 527
Maternity insurance. Lehrfeld................................636, 674
Maturity, fetal, study of, in utero. Reed.............................. 860
Measles contracted in utero. Kincaid.............................. 859
cultivation of micrococcus from blood in. Tunnicliff............... 871
morbidity and mortality of, with particular reference to age. Veeder. 876
Schick test in. Zingher.. 869
Measurements, certain pelvic, the true value of. Huntington............ 277
Medical Reserve Corps of the United States Army, notice to officers of the. 861
Meigs. Maternal mortality from childbirth in the United States and its relation to prenatal care..................................392, 504
Meningitis, meningococcus, in the new-born. Miller.................... 530
tuberculous, specific diagnosis of. Kasahara.................... 554
Meningococcus meningitis in the new-born, with interesting and unusual features. Miller... 530
Menstruating surface, fundal hysterectomy to reduce the. Dickinson...740, 819
Menstruation, on the blood loss from. Lahille......................... 697
precocious, a case of. Lucas................................. 522
Mental disease, how to safeguard the child against. Taft................ 186
Mentality and intelligence tests. Herrick............................ 183
Merrill. Some economic hints from France............................ 405
Metabolism, relation of the sex glands to. Murlin and Bailey.......... 684
twenty-four-hour, of two normal infants. Talbot................. 356
Micrococcus, cultivation of, from blood in measles. Tunnicliff............ 871
Milk and milk products, experimental scurvy produced in guinea-pigs. Moore and Jackson.. 373
-borne infection in the transmission of human communicable diseases. Kelley... 375
certified, observations on the presence of the bacillus aborticus in. Fleischner and Myers.................................... 551
cow's, coagulation of, in the human stomach. Brennemann........ 555
human, problems connected with the production and collection of. Hoobler.. 544
lactic acid bacilli, the use of. McClanahan..................... 547
production, human, the effect on, of diets containing various forms and quantities of protein. Hoobler.............................. 717
Miller. A case of meningococcus in the new-born, with interesting and unusual features... 530
Injuries at birth, premature births and stillbirths.............615, 674
Radium in the treatment of uterine hemorrhage and fibroid tumors.. 513
Millias. Types of juvenile psychoses.................................. 188
Mills. Probable ovarian pregnancy.................................... 116
Mitchell. Phenolsulphonephthalein elimination in infants and children.... 711

Mole, hydatid, chorioepithelioma following. Jellinghaus 141
Moriarta. Radium; further clinical observations 781, 844
Morley. The preparation and standardization of ovarian and placental extracts 683
Morse. Edebohls' operation in nephritis in childhood 709
Mortality from childbirth. Kosmak 1016
Mucous gastritis in the nursling. Chevrel 866
Murlin. Relation of the sex glands to metabolism 684
Myers. Observations on the presence of the bacillus aborticus in certified milk 551
Myomas of the uterus; myomectomy. Mayo 342
Myomectomy for myomas of the uterus. Mayo 342
    in pregnancy. Alfieri 146

N

Nasal diphtheria, isolated. Rolleston 871
Nasopharyngeal infections, relation of, to general systemic disorders. Crowe, Watkins and Rothholz 378
Necrobiosis, placental. Zarate 147
Necrosis, liver, influence of oxygen on. Spencer 898
Neonatorum, pemphigus. Falls 207
Nephritis, Edebohls' operation in. Morse 709
    in childhood. Berkley and Lee 872
    luetic, in infancy and childhood. Butterworth 720
Neuroses, minor, of childhood. Epstein 1027
Nitrogen, nonprotein, of the blood in atrophic infants. Minsk and Sauer .. 875
    partition in urine of normal children. Johnston and Veeder 876
Nitrous oxid-oxygen analgesia and anesthesia in obstetrics. Copeland .. 858
    -oxid analgesia in obstetrics. Danforth 563
    -oxid-oxygen, chloroform, and ether, a study of, in pregnancy and labor. Davis 557
Noble. A case of a giant colon 946, 1001
Nocturnal enuresis, treatment of, by suggestion. Dunham 372
Nonmalignant conditions, the technic of total hysterectomy for. Worrall. 894
Nonprotein nitrogen of the blood in atrophic infants. Minsk and Sauer... 875
Nose and throat, the relation of the, to cervical adenitis. Wood 174
Nulliparous woman, procidentia in the. Ford 438, 498
Nursing, maternal, restoration of, after sixteen days of complete interruption. Southworth 527
Nutrition, defective, in early life. Bartley 171

O

Obstetric paralysis. Sever 373
    problems and the coroner's office. Wadsworth 622, 674
    problems, several every-day. De Lee 15, 91
    surgery, indications in. Lazard 909
Obstetrical significance of blood-sugar with special reference to placental interchange. Morriss 341

Obstructive jaundice. Heyd.......... 409

Oöphorectomy, bilateral, in a gravida. Stropeni.......... 694

Operation by Spinelli method. Shoemaker.......... 268, 313

  for procidentia uteri. Helmuth.......... 342

Operative procedures on the genital tract, pregnancy and labor following. Ronsheim.......... 289

  treatment of procidentia. Jones.......... 752, 830

Otosclerosis, fragilitas ossium and its association with. Bronson.......... 873

Ovarian and placental extracts, the preparation and standardization of the. Morley.......... 683

  cyst postpartum complicated by mechanical ileus. Ronsheim.......... 851

  dysmenorrhea, use of *x*-rays in certain forms of. Hernaman-Johnson.......... 1022

  pregnancy. Sweeney.......... 139

  pregnancy, probable. Mills.......... 116

  teratoma, carcinomatous, with premature puberty and precocious development. Harris.......... 696

  tissue, transplantation and retention of, after hysterectomy. Graves.......... 683

Ovaries, papillo-cystoma of the. Peskind.......... 448

  Röntgentherapy successful in uterine fibroid without affecting the. Pfahler and McGlinn.......... 262, 317

Ovary, adenomyoma of the. Rabinovitz.......... 67, 142

  papillomatous cysts of the. Schwartz.......... 855

  retention cysts of the. Rubin.......... 345

  simulation of ectopic pregnancy and early uterine abortion by corpus luteum and retention cysts of the. Rubin.......... 345

  the relation of the, to the uterus and the mammary gland from the experimental aspect. Loeb.......... 681

  unilateral defect of. Gellhorn.......... 877

Overcrowding in institutions and hospitals for children. Southworth, Stowell and Van Ingen.......... 201

Oxygen, influence of, on liver necrosis. Spencer.......... 898

P

Pedicle, twisted, wandering spleen with, removed from the true pelvis. Zimmermann.......... 116

Pellagra in a child residing in the District of Columbia. Foote.......... 1023

  in children. Murphy.......... 873

Pelvic measurements, internal, instrument for making. Cherry.......... 132

  measurements, the true value of. Huntington.......... 277

Pelvis, closure and filiform drainage of the. Chaput.......... 347

  double obliquely contracted. Lazard.......... 585

  true, wandering spleen with twisted pedicle removed from the. Zimmermann.......... 116

Pemphigus neonatorum. Falls.......... 207

Percy. The end results of the treatment of inoperable uterine cancer by heat.......... 993

Perineal laceration, complete, cinemetograph demonstration of the operation for the cure of. Ill.......... 827

Perlèche. Smith 872
Pertussis and measles, morbidity and mortality of, with particular reference to age. Veeder 876
  vaccines. Shaw 161
Peskind. Report of a case of papillo-cystoma of the ovaries 448
Pfahler. Röntgentherapy successful in uterine fibroid without affecting the ovaries 262, 317
Pfeiffer. Eclampsia complicated by accidental hemorrhage and flat pelvis, postoperative pulmonary edema, intestinal paresis and lochiometra 111
  Some causes of fetal death 74, 121
Phaler. *X*-ray treatment of enlarged cervical glands 177
Pharmacological and clinical investigations into the action of erodium cicutuarium, a hemostatic in uterine hemorrhages. Van Dongen 857
Phenol excretion in the urine of infants, including the new-born. Moore 375
Phenolsulphonephthalein elimination in infants and children. Mitchell and Gittings 711
Physical conditions in women warranting sterilization. Hedges 745, 822
Pineal gland influence upon growth and differentiation. McCord 678
Pisek. Chylothorax in an infant 537
Pituitary body, interrelationship of female sex glands and the. King 964, 1010
  extract in labor. Trundell 858
  gland, the relation of the, to the female generative organs; from the experimental and clinical aspects. Goetsch 677
Pituitrin, action of, on the surviving human uterus. Chartevis 858
  small doses of, for inducing and shortening labor at term. Stein and Dover 1021
Placenta, desiccated, in the vomiting of pregnancy. Cary 860
  previa, Cesarean section in. Boyd 26, 80
  previa, methods of treatment of. Beach 57, 103
  previa, the *pros* and *cons* of accouchement forcé in. Tallant 46, 80
  previa, the treatment of; the more conservative methods. Arnold 38, 80
  regarded as a gland of internal secretion. Frank 683
  retained. Barnard 308, 477
  retained adherent. Reynolds 308, 477
Placental and ovarian extracts, the preparation and standardization of the. Morley 683
  interchange, obstetrical significance of blood-sugar with special reference to. Morriss 341
  necrobiosis. Zarate 147
Plasma of mother and fetus placental transmission. Plass 341
Pneumococci, types of, in infants and children. Mitchell 729
Pneumothorax, a case of, in a twelve-year-old boy. Abt 534
Polak. Clinical study of blood pressure, pulse pressure, hemoglobin in postoperative shock, postoperative hemorrhage, and postoperative cardiac dilatation 691
  Toxemia of pregnancy simulating acute yellow atrophy of the liver 125
Poliomyelitis, acute, colloidal gold reaction of cerebrospinal fluid in. Felton and Maxcy 732
  acute. Peabody 868

Poliomyelitis, anterior, diagnosis and serum treatment of. Zingher...... 865
  bacteriology and probable means of spread of. Greeley.......... 866
  cerebrospinal fluid in Jeans and Johnston.......... 732
  clinical observations on, during the 1916 epidemic. Heiman...... 724
  contribution to. Carr.......... 728
  human, does the spinal fluid from, contain the specific infective agent? Abramson.......... 731
  Schick test in. Zingher.......... 869
  the early diagnosis of. Ayer.......... 168
Pool. The immediate repair of the injuries of parturition.......... 53, 98
  The relation of the parathyroid system to the female genital apparatus.......... 679
Postoperative death, sudden, and tuberculosis of the suprarenal bodies. Brindeau.......... 697
Precocious development and premature puberty, carcinomatous ovarian teratoma with. Harris.......... 696
  menstruation, a case of. Lucas.......... 522
Pregnancy, a new method of treating pernicious vomiting of. Garnett.... 303
  abdominal, removal of sac one year after spurious labor. Caturani. 135
  advanced extrauterine, with living child. Lee.......... 147
  and labor, a study of chloroform, ether and nitrous oxid-oxygen in.. Davis.......... 557
  and labor, following operative procedures on the genital tract. Ronsheim.......... 289
  and the puerperium, maternal and fetal blood during. Fullerton.. 918
  at the site of previous incomplete abortion. Mack.......... 118
  complicated by a uterus duplex unicollis. Ronsheim.......... 851
  complicating fibroids. Robertson.......... 130
  desiccated placenta in the vomiting of. Cary.......... 860
  ectopic. Oastler.......... 148
  ectopic, simulation of, and early uterine abortion by corpus luteum and retention cysts of the ovary. Rubin.......... 345
  ectopic, transplantation of, from fallopian tube to cavity of uterus. Wallace.......... 857
  failing cardiac compensation during. Lawrence.......... 346
  myomectomy in. Alfieri.......... 146
  of woman, infectious abortion of cattle as a complication of. De Forest.......... 221, 320
  ovarian. Sweeney.......... 139
  probable ovarian. Mills.......... 116
  pyelitis during. Leavitt.......... 297
  salpingo-ovaritis as a complication of. Brindeau.......... 695
  the operation of choice to terminate, when subsequent pregnancy is to be avoided. Marvel.......... 271, 315
  the toxemias of. Losee and Van Slyke.......... 149
  toxemia of, simulating acute yellow atrophy of the liver. Polak.. 125
Pregnant woman, modifications of the antitryptic power of blood serum in the. Ecalle.......... 856
Premature births and stillbirths. Miller.......... 615, 674
Prenatal care. Child.......... 631, 674

Prenatal care—a national question. Kosmak........................ 489
care—an opportunity for the medical profession. Emmons.....401, 503
care, development of, in the Borough of Manhattan. Lobenstine. 381, 503
care, maternal mortality from childbirth in the United States and its relation to. Meigs.................................392, 504
development, the pineal gland influence upon growth and differentiation, with particular reference to the influence upon. McCord.. 678
President's address, thirtieth annual meeting American Association of Obstetricians and Gynecologists. Keefe....................733, 819
Procidentia in the nulliparous woman. Ford......................438, 498
operative treatment of. Jones.............................752, 830
uteri, operation for. Helmuth.............................. 342
uteri or cystocele, a vaginal subtotal hysterectomy technic, equally applicable to cases with or without. Bissell.................. 687
Prolapse of the uterus. Bonifield.................................750, 830
uterine, and cystocele, treatment of, during the child-bearing period. Watkins.. 687
Protein administration, foreign, accidents in. Kerley................. 531
Pseudohermaphroditism. Caturani................................. 136
report of a case of. Purdum............................... 813
Psychology *vs.* psychiatry in diagnosing feeblemindedness. Cornell..... 188
Psychoses, juvenile, types of. Millias.............................. 188
Puberty, premature, and precocious development, carcinomatous ovarian teratoma with. Harris................................. 696
Puerperal septicemia. Krusen...................................605, 674
Pulmonary fissures and lobes, topography of, in infants, Gittings, Fetteroff and Mitchell.. 373
Pulse pressure, clinical study of. Polak............................. 691
Purdum. Report of a case of pseudohermaphroditism.................. 813
Pyelitis cases, focal lesions produced in the rabbit by colon bacilli isolated from. Helmholz and Beever............................ 369
during pregnancy. Leavitt................................... 297
in children. Quinby... 731
Pyloric stenosis in infants. Gallie and Robertson..................... 374
Pylorospasm in the nursling. Chevrel............................... 866
Pyuria and bacteriuria, relation of, to intestinal disturbances in children. Neff... 731
Palliative treatment of inoperable carcinoma of the cervix by radium. Frank... 342
Pancreas, the endocrine function of the. Carlson 680
Papillo-cystoma of the ovaries. Peskind............................. 448
Papillomatous cysts of the ovary. Schwartz.......................... 855
Pappenheimer. The possible bearing of the thymus gland upon the female genital tract.. 680
Paralysis, infantile, astragalectomy in. MacAusland................... 377
infantile, recent epidemic of. Emerson........................ 867
obstetric. Sever.. 373
Parathyroid gland, the physiological and pathological importance of the, from the experimental aspect. Voegtlin......................... 678
system, relation of the, to the female genital apparatus. Pool.... 679

Paresis, intestinal, and lochiometra, eclampsia complicated by. Pfeiffer. 111
Parturition, report of a case of acute inversion of the uterus following. Griffin.......... 639
    the immediate repair of the injuries of. Pool.......... 53, 98
Pathogenesis of infantile scurvy—a hypothesis. Gerstenberger.......... 727

R

Rabinovitz. Adenomyoma of the ovary..........67, 142
Radiotherapy in gynecology. Keene.......... 696
    in uterine hemorrhage of benign origin. Clark.......... 514
Radium; further clinical observations. Moriarta..........781, 844
    in the treatment of uterine hemorrhage and fibroid tumors. Miller. 513
    in uterine cancer. Bailey.......... 514
    palliative treatment of inoperable carcinoma of the cervix by. Frank.......... 342
    treatment of uterine hemorrhage due to other causes than malignancy. Kelly.......... 513
Radiumtherapy in cancer of the uterus. Recasens.......... 859
Rawls. A cystoscopic study of the end results of various forms of cystocele operations.......... 686
Rectovaginal septum, adenomyoma of the. Cullen.......... 517
Reder. Cervical lacerations; their significance for the patient..........756, 837
Reed. Gastrointestinal conditions in women.......... 517
Responsibility of the American Pediatric Society in the present national crisis. Churchill.......... 349
Retained adherent placenta. Reynolds..........308, 477
    placenta. Barnard..........308, 477
Retroversion of the uterus. Williams.......... 343
Reviews: Brubaker. Compend of human physiology.......... 340
    Buck. The growth of medicine from the earliest times to about 1800.......... 144
    De Normandie. Case histories in obstetrics.......... 693
    Dercum. Rest, suggestion and other therapeutic measures in nervous and mental diseases.......... 693
    Eden. Gynecology for students and practitioners.......... 520
    Einhorn. Diseases of the stomach.......... 1019
    Havard. Manual of military hygiene for the military service of the United States.......... 143
    Mason. A complete handbook for the sanitary troops of the U. S. Army and Navy and National Guard and Naval Militia.......... 143
    Munro. Handbook of suggestive therapeutics, applied hypnotism, and psychic science.......... 144
    Ochsner. Physical exercises for invalids and convalescents.......... 694
    Ruhrah. Poliomyelitis.......... 729
    Sluss. Emergency surgery.......... 144
    Tuttle and Hurford. Diseases of children.......... 1044
    Wood. Clinical gynecology.......... 1020
Reynolds. Retained adherent placenta..........308, 477
Robertson. Pregnancy complicating fibroids.......... 130

Ronsheim. Ovarian cyst postpartum complicated by mechanical ileus... 851
  Pregnancy and labor following operative procedures on the genital tract...289, 854
  Pregnancy complicated by a uterus duplex unicollis... 851
Röntgenograms, diagnosis of the age of the fetus by. Hess... 710
Röntgentherapy successful in uterine fibroid without affecting the ovaries. Pfahler and McGlinn...262, 317
Royston. A statistical study of the causes of abortion... 571
Rumination in the first year of life. Grulee... 552
Rupture of the uterus. Scott... 423

S

Salpingitis, chronic hemogenic. Danforth... 346
Salpingo-ovaritis as a complication of pregnancy. Brindeau... 695
Salts in green vegetables and the effect of different modes of cooking. Bartlett... 362
Sarcoma of the brain simulating hydrocephalus. Holt... 537
Scar, Cesarean, an anatomical study. Losee... 1
Scarlet fever, Schick test in. Zingher... 869
Schick test in poliomyelitis, scarlet fever, measles and in normal children. Zingher... 869
Schildecker. In memory of James Roy Freeland... 818
Schuyler. Indicanuria in children... 155
Schwartz. Papillomatous cysts of the ovary... 855
  Septic infection following abortion... 852
  Uterus subseptus with double cervix and vagina. Hematocolpox, hematometra, and bilateral hematosalpinx... 119
Sclerotics, blue, fragilitas ossium and its association with. Bronson... 873
Scott. Acute dilatation of the uterus...763, 838
  Rupture of the uterus... 423
Scurvy, experimental, produced in guinea-pigs by milk and milk products. Moore and Jackson... 373
  infantile, a pathogenesis of. Gerstenberger... 727
  infantile, subacute and latent. Hess... 377
  infantile: Therapeutic value of yeast and of wheat embryo. Hess. 376
Sedgwick. The institution, reëstablishment and maintenance of breast feeding... 539
  The uric acid content of the blood in new-borns... 360
Sellman. Treatment of appendicular abscess...950, 1002
Septic infection following abortion. Schwartz... 852
Septicemia, acute endometritis and, following parturition. Graves... 458
  puerperal. Krusen...605, 674
Septum, rectovaginal, adenomyoma of the. Cullen... 517
Serum, antipoliomyelitic, production of. Nuzunc... 378
  blood, the therapeutic use of. Freeman... 354
  treatment of anterior poliomyelitis. Zingher... 865
Sex glands, interrelationship of, and the pituitary body. King...964, 1010
  glands, relation of, to metabolism. Murlin and Bailey... 684
Shaw. Pertussis vaccines... 161

Shock and trauma, the value of the avoidance of, in the treatment of eclampsia. Cragin....211, 332
Shoemaker. Inversion of uterus. Operation by Spinelli method. Recovery of the patient....268, 313
Simpson. Gynecology; its problems.... 329
Sinus, hemorrhagic abdominal. Warren.... 134
  longitudinal, a site for obtaining blood and for transfusion. Tarr... 870
Skin defects, congenital. Abt.... 365
  diseases, x-ray and radium in the treatment of. MacKee.... 1040
Sodium chloride, excretion of, injected subcutaneously. Holt, Courtney and Fales.... 375
Southworth. A familial tendency to fat incapacity in infancy and childhood.... 548
  A proper basis for a law to prevent overcrowding in institutions and hospitals for children.... 201
  The restoration of maternal nursing after sixteen days of complete interruption.... 527
Spencer. A study of the influence of oxygen on liver necrosis (chloroform poisoning).... 898
Spinal fluid from human poliomyelitis, does the, contain the specific infective agent? Abramson.... 731
  fluid of children, chemistry of the. Leopold and Bernhard.... 376
Spine, operative immobilization of the. DeQuervain and Hoessly.... 874
Spinelli method, operation by. Shoemaker....268, 313
Spleen, wandering, with twisted pedicle removed from the true pelvis. Zimmermann.... 116
Sporadic cretinism, three children with, in one family. Herrman.... 525
Stenosis, pyloric, in infants. Gallie and Robertson.... 374
Sterility, the cervicoplastic treatment of. Sturmdorf.... 469
  vaginal plastic operations or stem pessaries as an exclusive treatment for. Holden....64, 87
Sterilization, physical conditions in women warranting. Hedges....745, 822
Stewart. The left Fallopian tube and intestinal stasis....943, 1001
Stillbirths. Miller....615, 674
Stomach, effect of body posture on the position and emptying time of the. DeBuys and Henriques.... 698
  human, coagulation of cow's milk in the. Brennemann.... 555
Stowell. A proper basis for a law to prevent overcrowding in institutions and hospitals for children.... 201
Stricture, ureteral; report of 100 cases. Hunner.... 685
Sturmdorf. The cervicoplastic treatment of sterility.... 469
Subacute and latent infantile scurvy. Hess.... 377
Sulphur, use and value of, in vaginitis. Gill.... 1022
Suprarenal bodies, sudden postoperative death and tuberculosis of the. Brindeau.... 697
Surgeon's responsibility to the economics of the hospital. Marvel.... 482
Surgery, obstetric, indications in. Lazard.... 909
Surgical conditions complicating the process of generation. Hirst.... 971
Sweeney. Ovarian pregnancy.... 139
Symphysiotomy antepartum, indication for. Fieux.... 861

Syphilitic disease of the thymus in infants and mode of origin of Dubois abscesses. Oliver.......... 555

T

Taft. How can we safeguard the child against mental disease?.......... 186
Talbot. Rôle of food idiosyncrasies in practice.......... 165
  Twenty-four-hour metabolism of two normal infants with special reference to the total energy requirements of the infants.......... 356
Tallant. The *pros* and *cons* of accouchement forcé in placenta previa.......... 46, 80
Taussig. Etiologic study of vulvar carcinoma.......... 516, 794
Teeth, cervical lymphadenitis due to infections arising in and about the Hartzell.......... 175
Testicle in a woman. Caturani.......... 136
Therapeutic use of blood serum. Freeman.......... 354
Thymus, enlargement of the, treated by the x-ray. Friedländer.......... 366
  gland, the possible bearing of the, upon the female genital tract. Pappenheimer.......... 680
  syphilitic disease of the, in infants, and mode of origin of Dubois abscesses. Oliver.......... 555
Thyroid gland in relation to gynecology and obstetrics. Marine.......... 680
  in gynecology. Hayd.......... 958, 1010
Tonsillar and nasopharyngeal infections, relation of, to general systemic disorders. Crowe, Watkins and Rothholz.......... 378
Tonsillectomy, immediate, in acute endocarditis. Fleischner.......... 380
Toxemia of pregnancy. Losee and Van Slyke.......... 149
  of pregnancy simulating acute yellow atrophy of the liver. Polak. 125
Trachelitis, rebellious, the treatment of. Dickinson.......... 115
Transfusion, direct, a case of hemorrhagic disease in the new-born treated by. Knox.......... 523
  longitudinal sinus a site for obtaining blood and for. Tarr.......... 870
Tube and ovary, unilateral defect of. Gellhorn.......... 877
Tuberculosis, D'Espine sign in. Bloom.......... 876
  incidence of bovine infection of, in children. Wang.......... 869
  of the urinary tract in women, degeneration of leukocytes in the urine as a diagnostic aid in. Wynne.......... 859
  sudden postoperative death and, of the suprarenal bodies. Brindeau. 697
Tuberculous meningitis, specific diagnosis of. Kasahara.......... 554
Tumor, mixed cell, of the kidney weighing 3 pounds in an infant ten months old. Darnall.......... 786, 849
Tumors, fatty, of the uterus. Elkin and Haythorn.......... 859
Turck. The mechanism of intestinal atony in children; etiology and treatment.......... 159

U

Unilateral defect of tube and ovary. Gellhorn.......... 877
Urachus, cyst of the. Chavannaz.......... 1022
Ureteral calculus. Judd.......... 853

Ureteral stricture; report of 100 cases. Hunner........................ 685
Uric acid content of the blood in new-borns. Sedgwick and Kingsbury..... 360
Urine of infants, phenol excretion in the. Moore...................... 375
    of normal children, nitrogen partition in. Johnston and Veeder. 876
Uteri, fifty, removed at Cesarean section. Williams.................. 326
    procidentia, operation for. Helmuth............................ 342
Uterine cancer, inoperable, treatment of, by heat. Percy............... 993
    cancer, radium in. Bailey..................................... 514
    carcinoma, types of. Zimmermann............................... 107
    fibroid, Röntgentherapy successful in. Pfahler and McGlinn... 262, 317
    fibroids with reference to their tendency to become sarcomatous. Warner.. 888
    hemorrhage, action of erodium cicutuarium, a hemostatic in. Van Dongen.. 857
    hemorrhage and fibroid tumors, radium in the treatment of. Miller. 513
    hemorrhage of benign origin, radiotherapy in. Clark............ 514
    hemorrhage, radium treatment of. Kelly..... 513
    prolapse, treatment of, during the child-bearing period. Watkins.. 687
Uteroscopy *vs.* transperitoneal hysterotomy. Heineberg................ 216
Uterus, acute dilatation of the. Scott............................. 763, 838
Uterus and mammary gland, relation of the ovary to the, from the experimental aspect. Loeb.. 681
    duplex unicollis, pregnancy complicated by a. Ronsheim......... 851
    fatty tumors of the. Elkin and Haythorn........................ 859
    inversion of. Shoemaker..................................... 268, 313
    myomas of the; myomectomy. Mayo............................... 342
    prolapse of the. Bonifield.................................. 750, 830
    radiumtherapy in cancer of the. Recasens....................... 859
    report of a case of acute inversion of the, following parturition. Griffin.. 639
    retroversion of the. Williams.................................. 343
    rupture of the. Scott... 423
    -subseptus with double cervix and vagina. Schwartz............. 119
    surviving human, action of pituitrin on the. Chartevis.......... 858
    transplantation of ectopic pregnancy from Fallopian tube to cavity of. Wallace.. 857

V

Vaccines, pertussis. Shaw.. 161
Vaginal hernia and its treatment. Hartmann........................ 347
    plastic operations or stem pessaries as an exclusive treatment of sterility. Holden.. 64, 87
    subtotal hysterectomy technic, equally applicable to cases with or without procidentia uteri or cystocele. Bissell................ 687
Vaginitis, use and value of sulphur in. Gill........................ 1022
Vander Veer. Carcinoma occurring in the stump of the cervix following suprapubic hysterectomy.................................. 771, 842
Van Ingen. A proper basis for a law to prevent overcrowding in institutions and hospitals for children............................. 201
Vaughan. The diagnosis and treatment of gall-stones.................. 982

Vegetables, green, salts in, and the effect of different modes of cooking. Bartlett 362
Vesicovaginal fistulæ, postoperative treatment of. Child 455, 495
Vincent. The experimental and clinical evidence as to the influence exerted by the adrenal bodies upon the genital system 681
Visceral defects, fascia, transplantation into. Neuhof 343
Vitamines, recent literature pertaining to. Fischer 699
Voegtlin. The physiological and pathological importance of the parathyroid gland from the experimental aspect 678
Vomiting of pregnancy, desiccated placenta in the. Cary 860
  pernicious, of pregnancy, a new method of treating. Garnett 303
Von Pirquet test, the value of the, as controlled by autopsy findings. Knox, Jr 714
Vulvar carcinoma, etiologic study of. Taussig 516, 794

W

Wadsworth. Obstetric problems and the coroner's office 622, 674
Wald. The care of sick children in the home 200
Warner. A case of Cesarean section in a primipara followed in the next pregnancy by a normal delivery 598
  Uterine fibroids with reference to their tendency to become sarcomatous 888
Warren. Hemorrhagic abdominal sinus 134
  The average birth-weight in 2000 confinements in the state of Maine. 932
Watkins. Treatment of cystocele and uterine prolapse during the childbearing period 687
Wells, Brooks Hughes, in memoriam. Kosmak 210
Welt-Kakels. Amaurotic family idiocy 1032
Werder. Recurrences after "five-year period" in carcinoma of the cervix 776, 842
Wet-nurse management in institutions, the technic of. Abt 540
White. The McDonald solution 986
Williams. An histological study of fifty uteri removed at Cesarean section. 326
Wolf. Some aspects of internal hydrocephalus 150
Wood. The relation of the nose and throat to cervical adenitis 174
Worrall. The technic of total hysterectomy for nonmalignant conditions. 894

X

X-ray and radium in the treatment of skin diseases in children. MacKee 1040
  enlargement of the thymus treated by the. Friedländer 366
  treatment of enlarged cervical glands. Phaler 177
X-rays in certain forms of ovarian dysmenorrhea. Hernaman-Johnson 1022

Y

Yeast, therapeutic value of, and of wheat embryo. Hess 376

Z

Ziegler. The Elizabeth Steel Magee hospital of Pittsburgh 255, 320
Zimmermann. Types of uterine carcinoma 107
  Wandering spleen with twisted pedicle removed from the true pelvis. 116

RG
1
A57
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